



# **YEMEN UNIVERSITY**

## **Faculty of Medical sciences**

### **Department of pharmacy**

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**2015**

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## مبررات تحديث الخطة الدراسية في برنامج بكالوريوس (صيدلة عامة)

### أولاً:- السير الزمني للخطط الدراسية

#### • الخطة القديمة:- الاولى (٢٠٠٨)

تم افتتاح كلية العلوم الطبية في العام ٢٠٠٨م والذي يتضمن برنامج بكالوريوس صيدلة حيث وتم اعداد مواصفات البرنامج والخطة الدراسية وتوصيف المقررات من قبل المختصين وبدأت الدراسة في البرنامج من العام ٢٠٠٨م، وتم تطبيق هذه الخطة على الدفع الدراسية الالية:-

الدفع	سنة الالتحاق	سنة التخرج
١	٢٠٠٩/٢٠٠٨	٢٠١٣/٢٠١٢
٢	٢٠١٠/٢٠٠٩	٢٠١٤/٢٠١٣
٣	٢٠١١/٢٠١٠	٢٠١٥/٢٠١٤
٤	٢٠١٢/٢٠١١	٢٠١٦/٢٠١٥
٥	٢٠١٣/٢٠١٢	٢٠١٧/٢٠١٦

#### • الخطة الثانية (٢٠١٣):-

بعد استكمال البنية التحتية والاكاديمية في العام ٢٠١٣م وبموجب توجيهات وزارة التعليم العالي ومجلس الاعتماد والاكاديمي بضرورة تحديث البرامج والاكاديمية بما في ذلك برنامج الصيدلة وبموجب قرار مجلس الجامعة للعام ٢٠١٣م، لعمل ورش تقييم وتحديث وتطوير للبرامج الاكاديمية والخطط الدراسية و تم إقرار عمل التحديثات للخطط الدراسية لما يخدم البرنامج لمواكبة المرجعيات الدولية.

- وتم تطبيق هذه الخطة على الدفع الدراسية الالية:-

الدفع	سنة الالتحاق	سنة التخرج
٦	٢٠١٤/٢٠١٣	٢٠١٨/٢٠١٧
٧	٢٠١٥/٢٠١٤	٢٠١٩/٢٠١٨
٨	٢٠١٦/٢٠١٥	٢٠٢٠/٢٠١٩
٩	٢٠١٧/٢٠١٦	٢٠٢١/٢٠٢٠
١٠	٢٠١٨/٢٠١٧	٢٠٢٢/٢٠٢١
١١	٢٠١٩/٢٠١٨	٢٠٢٣/٢٠٢٢



## ثانياً: مبررات العامة التحديث ٢٠١٣/٢٠١٤م.

### أ- المبررات العامة

- ١- تحديث توصيف البرنامج الأكاديمي والمقررات الدراسية بما يتطابق القوالب والشروط المعتمدة من مجلس الاعتماد الأكاديمي -وزارة التعليم العالي-اليمن.
- ٢- التوافق مع التحديثات في محتوى المقررات مع ما يتفق مع المرجعيات الإقليمية والدولية والتي تم الاعتماد عليها في توصيف البرنامج.
- ٣- ما يطرا من تحديثات في الخطط الدراسية ناتج عن ما يتطلبه سوق العمل والتوجهات في العلوم الصيدلانية.

### ب:مبررات التعديلات في التدريب الميداني والمقررات الدراسية :

- ١- خطة التدريب الميداني:- زيادة عدد الساعات الفعلية للتدريب في حقول التدريب الصيدلاني المختلفة من ٣٢٠ ساعة الى ٦٨٠ ساعة.
- ٢- المقررات الدراسية :-

المبرر	التحديث /التعديل
<b>المستوى الأول – الفصل الاول</b>	
حتى يلم بكل مهارات الكمبيوتر لمساعدة الطلاب في الاستفادة بجميع برامج الحاسوب	تحويل مسمى مقدمة في العلوم الحاسوب الى مهارات الحاسوب
للتوافق مع المرجعيات الإقليمية والدولية	اضافة مقرر علم الاحياء العام
تنفيذا لقرارات وزارة التعليم العالي والبحث العلمي باليمن	نقل مقرر الثقافة الإسلامية الى الفصل الثاني
للتوافق مع المرجعيات الإقليمية والدولية	اضافة مقرر مقدمة لتاريخ علم الصيدلة
للتوافق مع المرجعيات الإقليمية والدولية	حذف مقرر كيمياء فيزيائية
<b>المستوى الأول – الفصل الثاني</b>	
للتوافق مع المرجعيات الإقليمية والدولية	تعديل مسمى مدخل في علم الصيدلة الى مقدمة لتاريخ علم الصيدلة وتقديمه للفصل الاول
للتوافق مع المرجعيات الإقليمية والدولية	الغاء مقرر علم البيئة واستبداله بمقرر علم النبات والنباتات الطبية
للتوافق مع المرجعيات الإقليمية والدولية	إضافة مقرر فيزياء حيوية وصيدلة فيزيائية
للتوافق مع المرجعيات الإقليمية والدولية	نقل مادة الاحصاء الحيوي للفصل الثاني بالمستوى الخامس ودمجها مع طرق ومناهج البحث
<b>المستوى الثاني – الفصل الاول</b>	
للتوافق مع المرجعيات الإقليمية والدولية	تغيير مسمى مقرر فسيولوجي ١ الى مقرر علم وظائف الاعضاء البشري ١
للتوافق مع المرجعيات الإقليمية والدولية	اضافة مقرر علم الطفيليات
للتوافق مع المرجعيات الإقليمية والدولية	تغيير مسمى مقرر إدارة صيدلانية الى مقرر ادارة



الاعمال الصيدلانية ونقله للفصل الاول في المستوى الرابع.	
اضافة مقرر التحليل الالي	للتوافق مع المرجعيات الإقليمية والدولية
<b>المستوى الثاني – الفصل الثاني</b>	
تغيير مسمى مقرر فسيولوجي ٢ الى مقرر علم وظائف الاعضاء البشري ٢	للتوافق مع المرجعيات الإقليمية والدولية
تغيير مسمى مقرر انسجة الى مقرر علم الانسجة البشري	للتوافق مع المرجعيات الإقليمية والدولية
تغيير مسمى مقرر اسعافات اولية الى مقرر الصحة العامة والاسعافات الاولى ونقله الى الفصل الثاني في المستوى الثالث	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر علم الامراض	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر احياء دقيقة صيدلانية ١	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر الكيمياء الحيوية الصيدلانية ١	للتوافق مع المرجعيات الإقليمية والدولية
نقل مقرر علم الاحياء الجزيئي الى الفصل الاول في المستوى الرابع	للتوافق مع المرجعيات الإقليمية والدولية
<b>المستوى الثالث – الفصل الاول</b>	
تغيير مسمى مقرر كيمياء حيوية ١ الى مقرر الكيمياء الحيوية الصيدلانية ٢	للتوافق مع المرجعيات الإقليمية والدولية
تغيير مسمى مقرر علم الميكروبات الصيدلانية الى مقرر احياء دقيقة صيدلانية ٢	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر قوانين واخلاقيات الصيدلة	للتوافق مع المرجعيات الإقليمية والدولية
الغاء مقرر علم المناعة	متضمن في مقررات اخرى
تغيير مسمى مقرر علم النفس الى علم النفس الاجتماعي للمهن الصحية ونقله للفصل الثاني في المستوى الثالث	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر صحة مجتمع	للتوافق مع المرجعيات الإقليمية والدولية
<b>المستوى الثالث – الفصل الثاني</b>	
تغيير مسمى مقرر كيمياء حيوية ٢ الى مقرر الكيمياء الحيوية الصيدلانية ٣	للتوافق مع المرجعيات الإقليمية والدولية
الغاء مقرر علم الميكروبات الصيدلانية ٢	متضمن في مقررات اخرى
الغاء مقرر بيانات اكلينيكية	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر صيدلة مهنية ومستشفيات	للتوافق مع المرجعيات الإقليمية والدولية
تغيير مسمى مقرر كيمياء دوائية ١ الى الكيمياء الدوائية الصيدلانية ١ ونقله الى الفصل الاول في المستوى الرابع	للتوافق مع المرجعيات الإقليمية والدولية





المستوى الرابع – الفصل الاول	
تغيير مسمى مقرر كيمياء دوائية ٢ الى الكيمياء الدوائية الصيدلانية ٢ ونقله الى الفصل الثاني في المستوى الرابع	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر الكيمياء الحيوية السريرية	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر صيدلية المجتمع والممارسة الصيدلانية	للتوافق مع المرجعيات الإقليمية والدولية
المستوى الرابع – الفصل الثاني	
الغاء مقرر صحة عامة	متضمن في مقررات اخرى
الغاء مقرر طفيليات	متضمن في مقررات اخرى
تغيير مسمى كيمياء دوائية ٣ الى الكيمياء الدوائية الصيدلانية ٢	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر صيدلة سريرية ١	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر التقنية الحيوية الدوائية	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر تدريب ميداني ١	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر دراسة التوافق الدوائي	للتوافق مع المرجعيات الإقليمية والدولية
المستوى الخامس – الفصل الاول	
تغيير مسمى مقرر صيدلة سريرية ١ الى صيدلة سريرية ٢	للتوافق مع المرجعيات الإقليمية والدولية
تغيير مسمى كيمياء دوائية ٤ الى الكيمياء الدوائية الصيدلانية ٣	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر علم السموم	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر التغذية السريرية	للتوافق مع المرجعيات الإقليمية والدولية
اضافة مقرر تدريب ميداني ٢	للتوافق مع المرجعيات الإقليمية والدولية
الغاء مقرر طرق ومناهج بحث	متضمن في مقررات اخرى
المستوى الخامس – الفصل الثاني	
اضافة مقرر الكيمياء الدوائية الصيدلانية ٤	للتوافق مع المرجعيات الإقليمية والدولية
الغاء مقرر صيدلة مهنية ومستشفيات	متضمن في فصول سابقة
الغاء مقرر صيدلة سريرية ٢	متضمن في فصول سابقة
اضافة مقرر الاعلان والتسويق الدوائي	للتوافق مع المرجعيات الإقليمية والدولية



## PHARMACY BACHELOR PROGRAM SPECIFICATION

### 1. Basic information on the program

Program name & scientific degree awarded	Pharmacy Bachelor
The entity awarding the degree	Medical sciences college
The academic department responsible for the program	Pharmacy department
Other departments participating in the program	Medical sciences faculty (Medical laboratory dept., applied medical sciences dept.), Computer sciences & IT faculty ( Computer sciences dept.,)
Language of the study	ENGLISH
The year of beginning the program	2015
Study order	Obligatory attendance (minimum 75 %)
Facility of program execution	The university
Study system	Semester type - Credit hours
Study duration	5 academic years consisting of 10 academic semesters
The profession for which the program prepares the students	Pharmacy
The levels intended for qualifications	High school students
Qualification required for admission	High school certificate
Required Qualification Score %	70 %
Other conditions	Date of High school degree does not exceed 5 years.

### The Committee Of Program Preparation:

Prof.Maged alwan alshargabi: Dean of the medical science collage  
 Dr.Sadeq Mohammed al Mekhlafy: Assistant professor of head of pharmacy department. prof. of Pharmaceutical Medicinal chemistry  
 Dr.Jalal Al qadasi: prof. of Pharmaceutical Medicinal chemistry  
 Dr. Mahmoud Mahyoob Alburyhi: Prof. of Pharmaceutics  
 Dr.Alaa Al-maktri: Mcs. Pharm Pharmaceutics , the secretary of the committee

### 2. Faculty mission and aims

#### MISSION

The faculty mission is to offer to its students a remarkable high education service in medical sciences that concerns with students` acquiring of scientific knowledge and



skills that potentiate their capabilities to compete in work markets and make them a qualified medical staff able to lead and develop in medical work fields and creative and effective elements in their societies. The faculty also intends to contribute in progress of the medical scientific researches and to fulfill the community need to medical services.
<b>AIMS</b>
1. Rising & development of the medical high education and improvement of its outcomes .
2. Achieving superiority in academic , instructional and learning aspects of its Bachelor & postgraduate programs .
3. Enhancing of the effectiveness of its teaching staff to augment the students` learning.
4. Potentiating the students` personal, social and academic development and their technological innovation to provide the community with capable medical staff able to offer high medical services.
5. Providing a safe, health and stable educational environment that encourages learning and creation in the college`s students and teaching staff.
6. Participation in accomplishing newer scientific additions for humanity knowledge in medical fields by supporting the scientific researches for the favor of the local, regional and international communities.
7. Augmentation of the relationship with the local, Arabic and international scientific institutions to improve the health states and solving the communities problems by supporting researches and providing consultation services.
8. Supporting the loyalty of the faculty`s graduates and also its academic and administrative staff.
9. Encouraging the graduates' compliance to professional ethics and their commitment to their communities.
10. Best utilizing of its material and human resources for the favor of the learning and instructional processes in order to achieve its mission and objectives.
<b>3. Mission &amp; Aims of the academic department</b>
<b>PHARMACY DEPARTMENT</b>
<b>MISSION</b>
Pharmacy department intends to offer to its students a remarkable high education service in pharmaceutical sciences that concerns with students` acquiring of scientific knowledge and skills that potentiate their capabilities to compete in work markets and





make them a qualified medical staff able to lead and develop in pharmacy-related work fields and creative and effective elements in their societies. The college also intends to contribute in progress of the pharmaceutical researches and to fulfill the community need to pharmaceutical services.
<b>OBJECTIVES</b>
1. Rising & development of pharmacy high education and improvement of its outcomes .
2. Achieving superiority in academic , instructional and learning aspects of its Bachelor & postgraduate pharmacy programs
3. Enhancement of the effectiveness of its teaching staff to augment the students` learning.
4. Potentiating of the students` personal, social and academic development and their technological innovation to provide the community with capable pharmacists able to offer high pharmaceutical services.
5. Providing a safe, health and stable educational environment that encourages learning and creation in the college`s students and teaching staff.
6. Participation in accomplishing newer scientific additions for humanity knowledge in pharmacy by supporting the scientific researches for the favor of the local, regional and international communities.
7. Augmentation of the relationship with the local, Arabic and international pharmaceutical institutions to improve medications and solving the communities problems by supporting researches and providing consultation services.
8. Supporting the loyalty of the graduates and its academic and staff.
9. Encouragement of the graduates' compliance to pharmacy professional ethics and their commitment to their communities.
<b>4. Program`s mission</b>
The program intends to offer remarkable curriculum in pharmacy characterized with modernity and comprehension and focusing on development of both the knowledge and skill aspects of students in order to ensure graduation of highly qualified pharmacists who are able to provide high pharmaceutical services to their communities.
<b>5. Program AIMS</b>
1. Providing the students with scientific knowledge in basic sciences and pharmaceutical sciences including the modern ones that are essential to realize their duties and activities as pharmacists.





2. Developing the intellectual, professional and practical skills of the students to make them able to perform all types of pharmacy-related works.
3. Enhancing the transferable skills of the students to perform pharmacy profession with respect to their colleagues, patients and community and in compliance to the profession ethics and laws.

## 6. Program References

- Regulations provided by the council of quality assurance and academic accreditation – Ministry of High education & scientific research, Yemen.
- Standards of the Accreditation Council for Pharmacy Education (ACPE), 2013
- Similar Pharmacy BC programs awarded by regional and international universities and have been accredited by ACPE, including :
  - Sana'a university, Yemen
  - King Saud university, Saudi Arabia
  - Qatar University, Qatar
  - Beirut University, Lebanon
  - Pharma Alberta university , USA

## 7. Intended learning outcomes (ILOs) of the program

### Basic Intended learning outcomes (ILOs)

At the end of this program, the graduates shall have been able to :

<b>ILOs of knowledge &amp; understanding</b>	Recognize the scientific principles and technologies needed for practicing of pharmacy profession.
<b>ILOs of intellectual skills</b>	Analyze, apply, synthesize and evaluate information and concepts in various pharmacy –related works.
<b>ILOs of practical &amp; professional skills</b>	Practice pharmacy-related works safely and effectively.
<b>ILOs of transferable skills</b>	Influence positively in team work and consider ethics & laws during practicing of his/her profession& commit to serve patients & community

## 8. Curriculum Map

### Subsidiary Intended learning outcomes (ILOs)

#### ILOs of knowledge & understanding

- A1. Understand the current missions, duties and carriers of pharmacists as professionals and the



related pharmaceutical sciences and the historical progress of the profession.
<b>A2.</b> Know the structures and biological processes& functions of different parts in living organisms including those in human body& sources/causes & mechanisms of diseases.
<b>A3.</b> Understand the sources of matters (including drugs), their physicochemical, pharmaceutical, biological (therapeutic and toxicological) properties and how they interact with other matters.
<b>A4.</b> Recognize the basis of drug therapy (designing and monitoring) and its cost-effectiveness and the alternative therapy methods.
<b>A5.</b> Understand the, basic, modern and advanced pharmacy work principles and technologies applied for dosage forms formulation, analyzing drugs, understanding drug effects, searching for new drugs , applying new therapies and designing drug delivery systems.
<b>A6.</b> Understand the basics and rules of speech, reading and writing in the healthcare fields.
<b>ILOs of intellectual skills</b>
<b>B1.</b> Use various logic mental processes such as calculation, explanation, description, conclusion, and others in dealing with various phenomena/problems related to pharmacy works.
<b>B2.</b> Compare, differentiate and distinguish between related entities, phenomena and concepts and classify various entities based on certain properties.
<b>B3.</b> Bind phenomena, laws or equations to their affecting factors. In addition, how these change by enhancing or inhibiting of such factors.
<b>B4.</b> Determine the source of errors/problems and work to solve them.
<b>ILOs of practical &amp; professional skills</b>
<b>C1.</b> Handle, operate & run different tools, instruments and equipments involved in pharmacy works in drug plants, research & development centers, quality control departments and hospital, clinical and community pharmacies.
<b>C2.</b> Apply theoretical knowledge in performing different types of pharmacy works.
<b>C3.</b> Commit to standard operation procedures (SOPs) and safety criteria during practicing pharmacy works in Laboratories, hospitals, pharmacies and drug factories.
<b>C4.</b> Effectively & correctly use language grammars & fundamental skills (reading, writing and speech) , and the media and information sources (books, internet websites, computer programs) to present thoughts/ideas and to search for information
<b>ILOs of Transferable skills</b>
<b>D1.</b> Share successfully in teamwork & reporting activities.
<b>D2.</b> Show respect to life and commit to community serving.
<b>D3.</b> Communicate effectively with his/her colleagues, members of health care team, patients and other people.
<b>D4.</b> Comply to pharmacy laws and ethics and behave in discipline during practicing pharmacy works



No	Courses (ordered as appeared in the study plane)	Subsidiary ILOs																	
		A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
1.	Arabic language														√			√	
2.	English language 1						√		√						√			√	
3.	Introduction of computer sciences											√			√				
4.	Islamic culture																√		√
5.	Introduction to pharmacy history	√				√			√										
6.	General Biology		√						√			√		√		√	√	√	√
7.	General chemistry			√				√		√		√		√		√		√	√
8.	Pharmaceutical Organic chemistry 1		√												√	√		√	
9.	Pharmaceutical Organic chemistry 2			√				√		√		√		√		√		√	√
10.	Biophysics Physical pharmacy							√	√		√								
11.	Pharmaceutical analytical chemistry 1						√		√	√					√			√	√
12.	Medical terminology			√				√	√	√	√	√		√		√			
13.	Human Anatomy		√						√			√		√		√	√	√	√
14.	Public health and First aid	√		√		√													
15.	Human Histology		√	√		√		√	√	√	√	√		√		√		√	√
16.	Pharmaceutical Biochemistry 1								√								√		√
17.	Human Physiology I		√	√				√	√								√		
18.	General Pharmacognosy 1			√				√	√	√	√	√		√		√		√	√
19.	Pharmaceutics 1		√	√					√	√		√		√			√	√	√
20.	Pharmaceutical Organic chemistry 3		√	√				√				√		√		√	√	√	√
21.	Pharmaceutical analytical chemistry 2	√						√			√			√		√			
22.	Pharmaceutical Biochemistry 2		√	√				√	√								√		
23.	Human Physiology 2	√		√		√		√	√	√	√	√		√		√		√	√
24.	Pharmaceutics 2			√		√		√	√		√	√		√		√	√		
25.	General Pharmacognosy 2	√	√	√		√		√	√			√		√		√	√	√	√

11

**Prof. Maged  
Alshargabi**

**Dr. Sadeq  
Mekhlafy**

**Dr. Jalal  
Alqadasi**

**Dr. Mahmoud  
Alburyhi**

**Dr. Alaa  
Al-maktri**



No	Courses (ordered as appeared in the study plane)	Subsidiary ILOs																	
		A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
26.	Instrumental analysis		√	√		√			√	√	√	√		√		√	√	√	√
27.	Pharmaceutical microbiology 1		√	√				√	√								√		
28.	Pharmaceutical microbiology 2			√		√		√	√	√	√			√		√		√	√
29.	Pharmacology 1	√	√	√	√	√		√	√	√							√		
30.	Bonty and medicinal plants			√		√		√	√	√	√		√				√	√	√
31.	Pharmaceutics 3	√		√		√		√	√	√	√	√		√		√		√	√
32.	Phytochemistry 1		√	√		√			√	√	√	√		√		√	√	√	√
33.	Pharmacology 2	√	√	√	√	√		√	√	√							√		
34.	Pathology	√	√	√		√		√	√			√		√		√	√	√	√
35.	Pharmaceutical Medicinal chemistry 1		√	√				√	√								√		
36.	Pharmaceutical Quality control	√		√		√		√	√	√	√	√		√		√		√	√
37.	Biopharmacy&pharmacokinetics 1	√		√		√		√	√			√		√		√		√	√
38.	Parasitology	√	√	√	√	√		√	√	√							√		
39.	Biopharmacy&Pharmacokinetics 2	√		√		√		√	√	√	√	√		√		√		√	√
40.	Phytochemistry 2	√	√	√	√				√	√	√						√		
41.	Pharmaceutical biotechnology	√	√	√	√	√		√	√	√	√	√		√		√	√	√	√
42.	Industrial pharmacy 1	√	√	√	√	√		√	√	√	√	√		√	√	√	√	√	√
43.	Industrial pharmacy 2	√	√	√	√	√		√	√	√	√	√		√	√	√	√	√	√
44.	Pharmaceutical Medicinal chemistry 3	√	√	√	√	√		√	√	√	√	√	√	√	√	√		√	√
45.	Pharmacology 4	√	√		√			√	√		√						√	√	√
46.	Pharmaceutical Medicinal chemistry 2	√	√	√	√	√			√	√	√	√		√		√	√	√	√
47.	Toxicology & forensic medicine	√	√		√			√	√		√				√	√	√	√	√
48.	Clinical biochemistry	√	√	√	√	√		√	√	√	√	√		√		√		√	√
49.	Applied pharmacognosy 1	√	√		√			√	√		√				√	√	√	√	√
50.	Community Pharmacy& pharmacy practice	√		√	√	√		√	√	√	√	√		√		√	√		√
51.	Field training 1	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√





No	Courses (ordered as appeared in the study plane)	Subsidiary ILOs																	
		A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
52.	Applied pharmacognosy 2	√	√	√	√	√		√	√	√	√						√		√
53.	Pharmacology 3	√	√	√		√		√	√	√	√	√		√		√	√	√	√
54.	Scienc & technology of cosmetic production	√	√	√	√	√		√	√								√		√
55.	Psycho-sociology for health professional	√		√	√	√		√	√		√	√	√	√		√	√	√	√
56.	Advanced molecular biology	√		√	√	√		√	√			√	√	√		√	√	√	√
57.	Professional & Hospital pharmacy	√		√		√		√	√	√	√	√	√	√		√	√	√	√
58.	Field training 2	√	√	√	√	√		√	√		√				√	√	√	√	√
59.	Pharmaceutical Medicinal chemistry 4	√	√	√	√	√		√	√	√	√	√		√		√	√		√
60.	Biostatistics & Research methodology technques	√	√	√	√	√		√	√		√				√	√	√	√	√
61.	Clinical pharmacy 2	√	√	√	√	√		√	√		√	√	√	√		√	√	√	√
62.	Pharmaceutical Biochemistry 3		√		√			√	√		√						√		
63.	Pharmaceutics 4	√	√	√	√	√		√	√	√	√	√	√	√		√	√	√	√
64.	Management of drug side effect	√	√	√	√	√		√	√	√	√						√		
65.	Community medicine	√	√	√	√	√		√	√	√							√	√	
66.	Pharmacy Law and Ethics	√			√			√	√									√	
67.	Drug marketing & advertisement	√						√	√		√	√	√	√	√	√	√	√	√
68.	Clinical pharmacy 1	√	√	√	√			√	√	√	√	√	√	√	√	√	√	√	√
69.	Graduation Research							√	√		√	√	√	√	√	√		√	√
70.	Advanced Medical terminology							√	√		√	√	√	√	√	√		√	√
71.	English language 2						√	√	√		√	√	√	√	√	√		√	√
72.	Pharmaceutical business administration		√	√	√	√		√	√	√						√	√	√	



## 9. Teaching strategies

Teaching strategy	How to be used?
<b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b> : It depends on stimulation of the student's brain through a group of questions &/or <b>Concepts map</b> : which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using <b>learning aids</b> such as Data show projector	This is the most frequently employed teaching method in the program. It is to convey knowledge and explain theories to students. The efficiency of lecturing should be enhanced by using techniques such as Brain-storming: It depends on stimulation of the student's brain through a group of questions or Concepts mapping: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations and other techniques or by using learning aids such as Data show projector, Intelligent board and models
<b>lecture - Discussion</b> : a short lecture/ address followed by discussion	one of the widely spread method of interactive studying. The process of discussion raises the quality of participation and activity of students. This process isn't limited only to questions asked by professor. This method develops the ability of conformation ones' own idea and discussion
<b>Seminars</b> : these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.	Presentation of some topics in pharmaceutical sciences using Data show projector and power point program
<b>IT laboratory sessions</b> : average number of students in session(20-30) students	During the process of study and especially during laboratory lessons student is making technology processes independently by using appropriate
<b>Laboratory practice</b> : students doing experiments in labs individually or in small groups	Experimental Lab. For all pharmaceutical sciences
<b>Group projects</b> : students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills	Used during pharmaceutical sciences studies and " <b>Graduation research</b> " courses.
<b>Field training</b> : each 2-3 students are commissioned to do certain assignments in a real field entity such as drug factory, hospitals, pharmacies under supervision of both the field principle and an academic supervisor	Pharmaceutical training (600 total actual training hours) practically 6 months Training must be done in pharmacies of private and governmental hospitals, pharmacies, pharmaceutical industrial companies and accepted by the college. During the training period, students are supervised and evaluated by the college staff members in collaboration



	with the pharmacy supervisor. B. Pharm. Sc. Degree will be awarded only after acceptance of the student report and evaluation.
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## 10. Students Assessment strategies

### Assessment Rules

- No students is allowed to enter the final exam unless he/she has attended at least 75 % of the total number of course lectures/practical sessions.
- For courses that involve practical parts, the student will not pass the course unless he/she passes both theoretical and practical course parties
- The student will not pass the course unless he/she gain theoretical and practical course parties
- The minimum pass degree in the final theoretical exam is 30 % of the estimation weight of the exam.
- The minimum pass degree in the final practical exam is 30 % of the estimation weight of the exam.
- The student will pass the course if he/she gains at least 50 % of the total the estimation weight of the course.

### Assessment Methods

#### Description of methods

Assessment method	Description & courses
Written exam	<ul style="list-style-type: none"> <li>Will be used in most courses</li> <li>Closed-book pattern</li> </ul>
Oral exam	<ul style="list-style-type: none"> <li>Will be used in courses involving practical parts e.g. "General chemistry"</li> <li>Will be used in used in " Pharmacy training " courses where a specialized committee will implement the exam</li> </ul>
Assignments	<ul style="list-style-type: none"> <li>The student will be assigned to do homework paper, search, charts etc related to the course topics</li> <li>Used in most courses</li> </ul>
Quiz	<ul style="list-style-type: none"> <li>A predefined timed brief questions will be asked to be answered by the students</li> </ul>
Attendance	<ul style="list-style-type: none"> <li>Will be used in all courses</li> <li>Students will be informed that no one will attend the final exams unless he/she attends at least 75 % of the lectures and lab. practices (if any)</li> <li>Attendance degree will be based on the number of the lectures / lab. sections the student has attended.</li> </ul>



<b>Reporting</b>	<ul style="list-style-type: none"> <li>Will be used in courses including practical parts and also courses related to filed training</li> <li>A predefined template will be asked to filled by the student</li> </ul>
<b>Attitude</b>	<ul style="list-style-type: none"> <li>Will be used in courses including practical parts and also courses related to filed training</li> <li>Teachers of the lab. practice will instruct students of to follow standard procedures for safety lab works. Teachers will also inform students that they will evaluate their lab. attitude.</li> </ul>
<b>Pharmacy training Exams</b>	<ul style="list-style-type: none"> <li>40 % of the course degree will be based on attendance, attitude and reporting and implanted by the training supervisor</li> <li>60 % of the course degree will be based on oral exam implemented by specialized committee.</li> </ul>
<b>Graduation research project exam</b>	<ul style="list-style-type: none"> <li>40 % of the course degree will be implanted for each student by the project supervisor based on attendance and attitude</li> <li>60 % of the course degree will be implanted by a specialized committee for the whole students of the project based on research methodology, writing, presentation and discussion</li> </ul>

### More details of assessment method

#### 1.For courses involving no practical part

Item	Weight	Schedule
Attendance	5%	15 <sup>th</sup> week
Assignments and Quizzes	15 %	5 <sup>th</sup> and 12 <sup>th</sup> week
Mid-term exam (Writing)	20%	7 <sup>th</sup> or 8 <sup>th</sup> week
Final-exam (Writing)	60 %	16 <sup>th</sup> -17 <sup>th</sup> week
<b>Total Weight of the Course</b>	<b>100 %</b>	

#### 2.For courses involving a theoretical and practical parts

##### Theoretical part

Item	Weight	Schedule
Attendance	5 %	15 <sup>th</sup> week
Assignments and Quizzes	5 %	5 <sup>th</sup> and 12 <sup>th</sup> week
Mid-term exam (Writing)	10 %	7 <sup>th</sup> or 8 <sup>th</sup> week
Final-exam (Writing)	40 %	16 <sup>th</sup> -17 <sup>th</sup> week
<b>Total Theory. Weight</b>	<b>60 %</b>	

##### Practical part

Item	Weight	Schedule
Attendance	5 %	11 <sup>th</sup> week
Lab. Attitude	5 %	Weekly ; average
Reporting	5 %	Weekly; average
Final exam (theory or oral )	5 %	11 <sup>th</sup> week





Final exam (practical)	20 %	11 <sup>th</sup> week
Total Practical Weight	40 %	* : of the weight of the exam
Total Weight of the Course	100 %	
3. Pharmacy training assessment		
Items	Weight	
Attendance	10 %	
Attitude	10 %	
Reporting	20 %	
Final exam by committee*: Writing & Oral exam	60 %	
Total	100	
* : A committee of three of the teaching stuff including the teacher supervisor of the training.		
4. Graduation project assessment		
Each project will be assessed by a committee of three member as follows		
Items	Weight	
Project supervisor	70 %	
Internal examiner : a member of the department teaching stuff.	15 %	
external examiner : a qualified external examiner (either from other departments of the college or from another university)	15 %	
Total	100	
Assessment of the project by the project supervisor		
Items	Weight	
Attendance	50 %	
Attitude and collaboration	50%	
Total	100 %	
Assessment of the project by the other discussion member <sup>1</sup>		
Items	Weight	
Research methodology	30 %	
Research writing	30 %	
Presentation	25 %	
Discussion	15 %	
Total	100 % <sup>2</sup>	
<sup>1</sup> : The whole students team of the projects will be assessed as one		
<sup>2</sup> : to be converted to 15% for each examiner.		
Seminar Courses assessment		
Items	Weight	
Seminar	40 %	
Final written exam	60 %	
Total	100	



The seminar weight will be assessed (for the students group as one unit) as follows:	
Items	Weight
Presentation	10 %
Solving of the Case study questions	20 %
Discussion	10 %
<b>Total</b>	<b>40 %</b>

Description of grades			
Table of grades description			
Grade percentage %	Description		
90 – 100 %	Excellent		
80- 90 %	Very Good		
65- 80 %	Good		
50 –65 %	Pass		
<ul style="list-style-type: none"><li>Grade percentage with fractions greater than or equal 0.5 will be raised directly to the higher grade</li><li>The Table of grades description is used to describe course grade, semester grades , annual grades and overall grade</li></ul>			
Semester Grades %			
<ul style="list-style-type: none"><li><b>Credit Course grade</b> = courses grade percentage x credit hours of the course</li><li><b>Semester grade %</b> = cumulative credit courses degrees in the semester / total credit hours of the semester courses</li></ul>			
Annual Grades %			
<b>Annual grade %</b> = cumulative credit courses grades in the two semesters of the year / total credit hours of courses in the two semesters of the year.			
Overall Grade %			
<b>Overall grade</b> = cumulative credit courses grades in the five years / 172 Where, 172 is the total credit hours of courses in the five years of the study			
Credit academic Hours			
Academic year	Credit hours		Annual Total
	First semester	Second semester	
	Total	Total	



1 <sup>st</sup>	15	16	31
2 <sup>nd</sup>	19	18	37
3 <sup>rd</sup>	16	14	30
4 <sup>th</sup>	18	19	37
5 <sup>th</sup>	19	18	37
<b>Total</b>	<b>88</b>	<b>85</b>	<b>172</b>

### 11. Study system & Courses

<b>Study Type and duration</b>	Semester-based ; 5 academic years (levels), 10 academic semesters ; each semester is composed of 16 weeks (including exams periods).
<b>Total credit hours to accomplish the study</b>	172

#### Distribution of the total study credit hours

Requirements	Number of courses and credit hours and %
University requirement	5 courses ; 10 credit hours
Faculty requirements	10 courses ; 24 credit hours
Academic department requirements (essential requirements)	15 courses ; 34 credit hours
Academic department requirements (General Obligatory Specialty requirements)	40 courses ; 100 credit hours
Academic department requirements (Field training)	2 courses ; 4 credit hours
Academic department requirements (optional Specialty requirements)	None
<b>Total</b>	<b>72 courses ; 172 credit hours</b>

#### Courses Per Requirement

##### 1. Courses required by the university

No.	Code	Course	Credit hours
1.		Arabic language	2
2.		English language 1	2
3.		English language 2	2



4.		Introduction of computer sciences	2
5.		Islamic culture	2
<b>Total</b>			<b>10</b>
<b>2. Courses required by the faculty</b>			
<b>No.</b>	<b>Code</b>	<b>Course</b>	<b>Credit hours</b>
1.		General Biology	2
2.		General chemistry	3
3.		Pharmaceutical Organic chemistry 1	3
4.		Pharmaceutical Organic chemistry 2	3
5.		Pharmaceutical Organic chemistry 3	3
6.		Medical terminology	2
7.		Public health and First aid	2
8.		Biostatistics & Research methods & techniques	2
9.		Graduation Research	2
10.		Advanced Medical terminology	2
<b>Total</b>			<b>24</b>
<b>3. Courses required by the Department</b>			
<b>a. Essential required courses</b>			
<b>No.</b>	<b>Code</b>	<b>Course</b>	<b>Credits hours</b>
1.		Introduction to pharmacy history	2
2.		Community medicine	2
3.		Pharmacy Law and Ethics	2
4.		Pharmaceutical analytical chemistry 1	3
5.		Pharmaceutical analytical chemistry 2	3
6.		Biophysics & Physical pharmacy	2
7.		Human Anatomy	3
8.		Human Histology	2
9.		Human Physiology 1	2





10.		Human Physiology 2	2
11.		Bonty and medicinal plants	2
12.		Advanced molecular biology	2
13.		Psycho-sociology for health professional	2
14.		Pathology	2
15.		Parasitology	3
<b>Total</b>			<b>34</b>
<b>Specialty courses (obligatory &amp; field training)</b>			
<b>Pharmaceutics and Pharmacy practice courses</b>			
<b>No.</b>	<b>Code</b>	<b>Course</b>	<b>Credits hours</b>
1.		Pharmaceutics 1	3
2.		Pharmaceutics 2	3
3.		Pharmaceutics 3	3
4.		Pharmaceutics 4	3
5.		Biopharmaceutics & Pharmacokinetics 1	2
6.		Biopharmaceutics & Pharmacokinetics 2	2
7.		Pharmaceutical biotechnology	2
8.		Industrial pharmacy 1	2
9.		Industrial pharmacy 2	2
10.		Pharmaceutical Quality control	2
11.		Pharmaceutical microbiology 1	3
12.		Pharmaceutical microbiology 2	3
13.		Drug marketing and advertisement	2
<b>Total</b>			<b>32</b>
<b>Pharmaceutical chemistry and related courses</b>			
14.		Pharmaceutical Medicinal chemistry 1	3
15.		Pharmaceutical Medicinal chemistry 2	3
16.		Pharmaceutical Medicinal chemistry 3	3
17.		Pharmaceutical Medicinal chemistry 4	3
18.		Instrumental analysis	2



19.		Pharmaceutical business administration	2
20.		Pharmaceutical Biochemistry 1	3
21.		Pharmaceutical Biochemistry 2	3
22.		Science & technology of cosmetic production	2
23.		Pharmaceutical Biochemistry 3	3
<b>Total</b>			<b>27</b>
<b>Pharmacognosy and related courses</b>			
24.		General pharmacognosy 1	3
25.		General pharmacognosy 2	3
26.		Phytochemistry 1	3
27.		Phytochemistry 2	3
28.		Applied pharmacognosy 1	3
29.		Applied pharmacognosy 2	3
<b>Total</b>			<b>18</b>
<b>Pharmacology and related courses</b>			
30.		Pharmacology 1	2
31.		Pharmacology 2	2
32.		Pharmacology 3	2
33.		Pharmacology 4	2
34.		Toxicology & forensic medicine	2
<b>Total</b>			<b>10</b>
<b>Clinical Pharmacy and Pharmacy practice courses</b>			
35.		Management of drug side effects	2
36.		Field training 1	2
37.		Field training 2	2
38.		Clinical pharmacy 1	3
39.		Clinical pharmacy 2	3



40.		Clinical biochemistry	2
41.		Professional & hospital pharmacy	2
42.		Community Pharmacy & pharmacy practice	2
<b>Total</b>			<b>18</b>
<b>Overall Total</b>			<b>172</b>

<b>STUDY PLAN</b>									
<b>FIRST YEAR</b>									
<b>First semester</b>									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Arabic language		university	2	-	-	-	2	
2	English language 1		university	2	-	-	-	2	
3	Introduction of computer sciences		university	2	-	-	-	2	
4	Medical terminology		Faculty	2	-	-	-	2	
5	Introduction to pharmacy history		Essential	2	-	-	-	2	
6	General Biology		Faculty	2	-	-	-	2	
7	General chemistry		Faculty	2	1	-	-	3	
<b>Total</b>				14	1	-	-	15	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING



FIRST YEAR									
Second semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutical Organic chemistry 1		Faculty	2	1	-	-	3	
2	Islamic culture		university	2	0	-	-	2	
3	Biophysics & Physical pharmacy		Essential	2	-	-	-	2	
4	Pharmaceutical analytical chemistry 1		Essential	2	1	-	-	3	
5	Advanced Medical terminology		Faculty	2	0	-	-	2	
6	Bonty and medicinal plants		Essential	2	-	-	-	2	
7	English language 2		university	2	-	-	-	2	
Total				14	2	-	-	16	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING

SECOND YEAR									
First semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Human anatomy		Essential	2	1	-	-	3	
2	Parasitology		Essential	2	1	-	-	3	
3	Human Physiology 1		Essential	2	0	-	-	2	
4	Instrumental analysis		Specialty	2	-	-	-	2	
5	Pharmaceutics 1		Specialty	2	1	-	-	3	
6	Pharmaceutical Organic chemistry 2		Faculty	2	1	-	-	3	
7	Pharmaceutical analytical chemistry 2		Essential	2	1	-	-	3	
Total				14	5	-	-	19	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING





SECOND YEAR									
Second semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutical Biochemistry 1		Specialty	2	1	-	-	3	
2	Human Physiology 2		Essential	2	0	-	-	2	
3	Pharmaceutics 2		Specialty	2	1	-	-	3	
4	Human histology		Essential	2	-	-	-	2	
5	Pharmaceutical microbiology 1		Specialty	2	1	-	-	3	
6	Pathology		Essential	2	0	-	-	2	
7	Pharmaceutical Organic chemistry 3		Faculty	2	1	-	-	3	
Total				14	4	-	-	18	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING

THIRD YEAR									
First semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutical microbiology 2		Specialty	2	1	-	-	3	
2	Pharmaceutics 3		Specialty	2	1	-	-	3	
3	General pharmacognosy 1		Specialty	2	1	-	-	3	
4	Pharmaceutical Biochemistry 2		Specialty	2	1	-	-	3	
5	Pharmacy law and ethics		Essential	2	-	-	-	2	
6	Community medicine		Essential	2	-	-	-	2	
Total				12	4	-	-	16	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING



THIRD YEAR									
Second semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutics 4		Specialty	2	0	-	-	2	
2	Professional & hospital pharmacy		Specialty	2	-	-	-	2	
3	Public health & first aid		Faculty	2	0	-	-	2	
4	Pharmaceutics 3		Specialty	2	1	-	-	3	
5	Psycho-sociology for health professional		Essential	2	0	-	-	2	
6	Pharmaceutical Biochemistry 3		Specialty	2	1	-	-	3	
Total				12	2	-	-	14	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING

FOURTH YEAR									
First semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutical Medicinal chemistry 1		Specialty	2	1	-	-	3	
2	Pharmacology 1		Specialty	2	0	-	-	2	
3	Phytochemistry 1		Specialty	2	1	-	-	3	
4	Pharmaceutical business administration		Specialty	2	0	-	-	2	
5	Clinical biochemistry		Specialty	2	0	-	-	2	
6	Biopharmacy & pharmacokinetics 1		Specialty	2	-	-	-	3	
7	Community Pharmacy & pharmacy practice		Specialty	2	0	-	-	2	
8	Advanced molecular biology		Essential	2	0	-	-	2	
Total				16	2			18	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING



FOURTH YEAR									
Second semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutical Medicinal chemistry 2		Specialty	2	1	-	-	3	
2	Pharmacology 2		Specialty	2	0	-	-	2	
3	Phytochemistry 2		Specialty	2	1	-	-	3	
4	Clinical pharmacy 1		Specialty	2	1	-	-	3	
5	Pharmaceutical biotechnology		Specialty	2	0	-	-	2	
6	Biopharmacy & pharmacokinetics 2		Specialty	2	0	-	-	2	
7	Management of drug side effects		Specialty	2	0	-	-	2	
8	Field training 1		Specialty	0	0	-	2	2	
Total				14	3		2	19	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING

FIFTH YEAR									
First semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutical Medicinal chemistry 3		Specialty	2	1	-	-	3	
2	Pharmacology 3		Specialty	2	0	-	-	2	
3	Science & technology of cosmetic production		Specialty	2	0	-	-	2	
4	Clinical pharmacy 2		Specialty	2	1		-	3	
5	Applied pharmacognosy 1		Specialty	2	1	-	-	3	
6	Toxicology & forensic medicine		Specialty	2	0	-	-	2	
7	Industrial pharmacy 1		Specialty	2	0	-	-	2	
8	Field training 2		Specialty	0	0	-	2	2	
Total				14	3		2	19	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING



FIFTH YEAR									
Second semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmacology 4		Specialty	2	0	-	-	2	
2	Applied pharmacognosy 2		Specialty	2	1	-	-	3	
3	Biostatistics & research methods & techniques		Faculty	2	0	-	-	2	
4	Industrial pharmacy 2		Specialty	2	0	-	-	2	
5	Drug marketing and Advertisement		Specialty	2	0	-	-	2	
6	Pharmaceutical quality control		Essential	2	0	-	-	2	
7	Pharmaceutical Medicinal chemistry 4		Specialty	2	1	-	-	3	
8	Graduation Research		Faculty	0	2	-	-	2	
Total				14	4	-	-	18	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING

Academic year	Credit hours										
	First semester					Second semester					Annual Total
	L	P	S	TR.	Total	L	P	S	TR	Total	
1 <sup>st</sup>	14	2	-	-	15	14	2	-	-	16	31
2 <sup>nd</sup>	14	5	-	-	19	14	4	-	-	18	37
3 <sup>rd</sup>	12	4	-	-	16	12	2	-	-	14	30
4 <sup>th</sup>	16	2			18	14	3		2	19	37
5 <sup>th</sup>	14	3		2	19	14	4		-	18	37
Total	70	15	2	4	91	71	16	4	2	90	172

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Alqadasi

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Alburyhi

Dr. Alaa  
Al-maktri





## 12. Admission & Registration requirements

- 1- The original certificate of secondary school graduation – scientific department- with at least 75 % overall performance grade associated with an authorial stamped copy of the certificate.

\*For certificates from outside Yemen, they must be translated (if not in Arabic language) and approved by authority entities in Yemen.

- 2- Registration fees
- 3- A photocopy of personal or family identity card.
- 4- 10 frontal personal photocopies with a white background.
- 5- A copy of the first 8 pages of the passport (for non-Yemeni students)  
The passport should be valid for at least one year to come.
- 6- A copy for health fitness certificate (for non-Yemeni students)

### Procedure for registration

Application for admission and registration should be done at the times specified by the university. The person who desire to admit this program should do the following :

1. Review the study system, regulations and the admission requirements (he/she can get a copy from the unit of admission and registration (UAR) in the university).
2. Review the admission application papers offered by the university, fill it by him/herself, and deliver it to the (UAR) in the university.
3. Deliver all the required certificates and papers required for admission to the UAR.
4. The administration of the UAR will revise the applier delivered papers to ensure their validation.
5. The UAR inform of the applier that his/her application is accepted/rejected.
6. If the application is accepted. He/she must pay the registration fee and deliver him/her a receipt for that.

## 14. Requirements of attendance and program accomplishment

The followings are ONLY basic terms that regulate the study in this program. Other important terms are delivered by the UAR to those who want to admit this program.

### **General regulations**

- The student who is regressed in this program will not be allowed to register in another program of the same faculty at the same time.

### **Attendance**

- Attendance of the student is obligatory in this program.
- At least he/she must attend at least 75 % of the study in both parts (theoretical and practical , if any)



- The student who fails to attend 75 % of each part will not be allowed to enter the final exams and will be considered "Failed" in the course. He/she also will not be allowed to attend the complementary exam either.

#### Proceeding to next levels

- The student will processing to the next level (academic year) of the study if he/she passes all the level courses.
- After performing the final exams and the complementary exams:
  - The student who has failed in two courses (in that level or in the previous levels) can proceed to the next level only if one of these courses is a university-required course.
  - The student who has failed in three courses (in that level or in the previous levels) can proceed to the next level only if one of these courses is a university-required course.
  - If the student failed in a non-practical based course, he has no need to attend that course in the next year.
  - If the student failed in a practical based course, he has to attend the whole course again (both theoretical and practical part of the course) in the next year.
  - The student who has passed a course will not be allowed to re-study that course again.

#### Outage and suspension of the study

##### The study outage

- The study outage is a state when the student stopped attending the study and has not deliver a request to suspend it. The outage period allowed is maximum of three academic years.
- The new curriculum (if any) of the program is applied to the outage student when he/she re-joins the study.

##### Suspension of the study

- The maximum allowed period of suspension is a maximum of two academic years or four academic semesters either consecutive or not.
- The new curriculum (if any) of the program is applied to the suspending student when he/she re-joins the study.
- The student whom wants to suspend the study must himself/herself (or a person authorized by him/her) deliver a written request to the dean of the faculty associated with a reasonable excuse for suspension.
- If the first semester has started, it is not permitted to accept requests of suspension.

#### Withdrawal from the study

- The student whom wants to withdraw from the study must himself/herself (or a person authorized by him/her) deliver a written request to the dean of the faculty.
- He/she must pay all financial fees of the study and must be free from demands from all related units of the university.



11. Graduation requirements	
Requirement	Details
Total number of courses and credit hours required for graduation	<ul style="list-style-type: none"> <li>A total of 72 course of a total of 172 credit hours</li> </ul>
Total number of actual field training hours required for graduation	<ul style="list-style-type: none"> <li>600 actual training hours</li> </ul>
Minimum grade for success in every course	<ul style="list-style-type: none"> <li>The minimum grade percentage is 50 %.</li> <li>With conditions that the student must Attain at least 30 % of the degree of: <ul style="list-style-type: none"> <li>The final theoretical exam</li> <li>The final practical exam</li> <li>The committee degree for graduation pharmacy field training courses.</li> </ul> </li> </ul>
Minimum grade for success in the program	<ul style="list-style-type: none"> <li>The minimum grade percentage is 50 % and the minimal grade is (pass).</li> </ul>

12. Resources required to execute the program
a. Learning sources
The program has the following learning sources

Learning source	Sections	Detail
White Boards	All	At least One at each classroom
Library	Office equipments	Reading tables, Computer tables, chairs , Shelves for books and periodicals
	Books and Periodicals	suitable number of books and periodicals that comprehend all courses
	Electronic Books	the library computers will be supplied with a variety number of electronic books and CDs that comprehend a lot of courses
Information technology sources	Computer desktops	( 6 computers at the library and 40 at the computer lab.)
	Data show projectors	Each classroom has one
	Printers	(1) at the library , (1) at the computer lab, (1) at the photocopy services center
	Photocopy machine	(1) at the library , (1) at the photocopy services center
	Scanner	(1) at the library , (1) at the computer lab, (1) at the photocopy services center



	Flash memory cards (6 G) and CDs	Suitable amounts at the library (1) at the photocopy services center
	Internet links	(1) at the library , (1) at the computer lab
	Wireless networks	In the middle of the faculty

## **b. Laboratories**

### **1. Number and names of labs**

<b>No.</b>	<b>Lab. Name</b>
1.	Pharmaceutics Lab.
2.	Pharmacognosy & Phytochemistry Lab.
3.	Pharmaceutical Chemistry Lab
4.	Clinical and Biomedical Lab.
5.	Parasitology & Microbiology Lab.
6.	Anatomy & Histology Lab.
7.	Virtual Pharmacy
8.	Computer Lab.

## **c. Tools & Equipments**

### **1. Essential tools:**

Filter papers	Test-tubes and holders	Burettes
Glass rods	Conical flasks	Funnels
Separating funnels	Calibrated flasks	Beakers
Measuring volumetric cylinders	Pipettes	Package Bottles
Microscopic slides	Washing bottles	Syringes
Spoons	Spatulas	Stands

- These tools of different sizes should be available in each lab (if necessary) and in a suitable numbers as being required.

### **2. Essential instruments :**

- 1. Electronic balances:** (appropriate number in each Lab. at least one of them reads two digits).
- 2. Thermometers :** whenever necessary and in suitable amounts
- 3. Bunsen burners :** whenever necessary and in suitable amounts
- 4. First aid set:** one in each lab.
- 5. Safety chart of instruction:** one in each lab.
- 6. Fire extinguisher bottle:** one in each lab.





**7. Air ventilation system :** Gas and vapor suction system : whenever necessary

**3. EQUIPMENTS :** the major equipments required are :

**Pharmaceutics Lab.**

No.	Tool/ equipment name	Quantity
1.	Manual capsule fillers	1
2.	Homogenizer	2
3.	Centrifuge	1
4.	Sieves	10
5.	Digital pH Meter	1
6.	Suppository Mould	3
7.	Magnetic stirrer	2
8.	Melting point apparatus	1
9.	Water bath (6holes)	1
10.	Hot plate	1
11.	Tablet hardness tester	1
12.	Desiccators	1
13.	Tablet Coating – pan	1
14.	Clarity test apparatus	1
15.	UV/visible Spectrophotometer	1
16.	Moisture analyzer	1
17.	Refrigerator	1



18.	Thermometer	2
19.	Tablet single press	1
20.	US Sonnicator	1
21.	Mortar and pestle small in size	15
22.	Mortar and pestle medium in size	25
23.	Mortar and pestle large in size	25
24.	Spoon and spatula	15
25.	Beaker's holder	15
26.	Buchner funnel (various sizes)	5
27.	Water bath (6holes)	1
28.	Magnetic stirrer	2
29.	Shaker	1
30.	Dissolution apparatus	1
31.	Disintegration apparatus	1
32.	Hardness digital tester	1
33.	Friability tester	1

### **Pharmacognosy & Phytochemistry Lab**

No.	Tool/ equipment name	Quantity
1.	Hot plate	1
2.	Soxhlet apparatus	2
3.	Oven	1
4.	Rotary evaporator	1

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5.	Electric shaker	1
6.	Simple distillation apparatus	6
7.	Steam distillation apparatus	٦
8.	Water bath (6holes)	1
9.	TLC chamber	2
10.	Magnetic stirrer	2
11.	Microscopes	18
12.	Electric grinder big	2
13.	Porcelain dish	15
14.	U .V lamp	1
15.	Mortar and pestle small in size	5
16.	Micro pipettes	5
17.	Desiccators	1
18.	Buchner funnel (various sizes)	10
19.	Chromatography plates	30
<b>Pharmaceutical Chemistry Lab</b>		
No.	Tool/ equipment name	Quantity
1.	UV/visible Spectrophotometer	1
2.	Hot plate	1
3.	Oven	1
4.	Buchner funnel(various sizes)	5



5.	Water bath (6holes)	1
6.	Autoclave	1
7.	Magnetic stirrer	2
8.	Sonnicator	1
9.	PH meter	1
10.	Colorimeter	1
11.	Mortar and pestle small in size	5
12.	Micro pipettes	5

### **Anatomy & Histology Lab.**

No.	Tool/ equipment name	Quantity
1.	Histology teaching slides	1 box
2.	Microscopes	20
3.	Microtome	1
4.	Histokintte 2000	1
5.	Microscopes	10
6.	Porcelain dish	14
7.	Teaching slides histology	2
8.	Tissue stains different types	4
9.	Anatomy models : Hip , eye, cardiac, kidney, dental care, skull, skeleton, elbow, male/female urogenital system, joints, muscular system, Brain, nervous system, Alimentary system, bones.	1 of each

### **Parasitology & Microbiology Lab.**

No.	Tool/ equipment name	Quantity
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1.	Bunsen burner	5
2.	Autoclave	1
3.	Microscopes	20
4.	Oven	1
5.	hot plates	2
6.	Incubator	1
7.	Water bath	2
8.	Thermometer	10
9.	pH meter	1
10.	Cupboard Storage	1
11.	Refrigerator	1
12.	Microscope with (slides, cover slips, stains, staining rack, immersion oil)	10
13.	Petri dishes	200

**Clinical and Biomedical Lab.**  
**( Clinical chemistry, Biochemistry, Pharmacology, Toxicology)**

No.	Tool/ equipment name	Quantity
1.	High performance chromatography (HPLC) with UV detector	1
2.	pH meter	1
3.	Refrigerator	1
4.	Microscopes	20
5.	UV/visible Spectrophotometer	1
6.	Hot plate	3



7.	Water bath	1
8.	UV/visible Spectrophotometer	1
9.	Organ bath with drums	5
10.	ELISA	1
<b>Virtual pharmacy</b>		
<b>Items</b>		
<ul style="list-style-type: none"> <li>• Shelves of appropriate size</li> <li>• Instructional charts for pharmaceutical calculations</li> <li>• Empty out-packages of a lot of pharmaceutical products available in the drug market and comprehend all generic names and variety of dosage forms</li> <li>• Table + computer desktop + electronic program of drug indexes + electronic books of drug indexes such as " Clinician drug index"</li> <li>• A group of books of drug indexes e.g. MEPPPO, MIMS</li> </ul>		
<b>Computer lab</b>		
<b>Items</b>		
<ul style="list-style-type: none"> <li>• Computer desktops and appendices : 20 on appropriate table</li> <li>• Chairs</li> <li>• Printer : 1</li> <li>• Scanner : 1</li> <li>• Microsoft Offices programs and other valuable</li> <li>• Internet link</li> <li>• Data show</li> <li>• White board</li> </ul>		



#### d. Chemicals & Reagents

A variety types of chemicals and reagents including : acids, alkalis, salts ,solvents , indicators, vehicles , culturing materials and others are required.

1- Sodium hydroxide	29- potassium thiocyanate	59. Aluminum chloride
2- Sodium lauryl sulphate	30- Potassium dichromate	60. nickel sulphate
3- Sodium oxalate	31- potassium nitrate	61. cobalt chloride
4- Sodium format	32- potassium chloride	62. naphthalin
5- Sodium chloride	33- potassium ferricyanide	63. zinc sulphate
6- Sodium borax	34- potassium iodide	64. zinc metal( powder)
7- Sodium nitroprusside	35- potassium chromate	65. lead chloride
8- Sodium azide	27- potassium carbonate	66. lead powder
9- Sodium sulphite	36- potassium permanganate	67. lead acetate
10- Sodium nitrate	37- potassium ferrocyanide	68. mercuric chloride
11- Sodium iodide	38- ammonium thiocyanate	69. mercuric sulphate
12- Sodium sulphate	39- Ammonium ferric citrate	70. mercuric nitrate
13- Sodium meta bisulphite	40- Ammonium ferrous sulphate	71. ferric sulphate
14- Sodium dodecyl sulphate	41- Ammonium tartrate	72. iron 3 chloride
15- Sodium nitrite	42. calcium hydroxide	73. iron 2 sulphate
16- Sodium bicarbonate	43. calcium carbonate	74. copper 2 acetate
17- Sodium carbonate	44. calcium sulphate	75. copper 2 sulphate
18- Sodium sulfide	45. calcium acetate	76. barium chloride
19- Tri Sodium citrate	46. calcium chloride	77. barium sulphate
20- Sodium acetate	47. magnesium carbonate	78. barium nitrate
21- Sodium bromide	48. magnesium sulphate	79. E.D.T.A
22- Sodium cobalt nitrite	49. manganese sulphate	80. zinc oxide
23- Sodium phosphate	50. magnesium tri silicate	81. Ascorbic acid
24- potassium bromide	51. Ammonium sulphate	82. citric acid
25- potassium cyanide	52. Ammonium oxalate	83. Benzoic acid
26- tripotassium citrate	53. Ammonium carbonate	84. Tartaric acid
27- potassium hydroxide	54. Ammonium bicarbonate	85. Tannic acid
28- Potassium sulphate	55. Ammonium chloride	86. D. sorbitol
	56. Ammonium acetate	87. stearic acid
	57. Aluminum sulphate	88. Boric acid
	58. Aluminum nitrate	89. Acetyl salicylic acid
		90. Sulphosalicylic acid

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91. Salicylic acid	108. cetostearyl alcohol	123. Sudan 3
92. Oxalic acid	109. kaolin	124. methyl orange
93. chloral hydrate	110. polyethylene glycol (liquid & solids)	125. bromocresol green
94. phenolphthalein	111. sucrose	126. phenol red
95. starch	112. charcoal	127. methyl red
96. gelatin	113. iodine	128. silver nitrate
97. alpha naphthol	114. lanolin	129. Fehling's solution A&B
98. beta naphthol	115. gentian violet	130. bromine water
99. gum tragacanth	116. oleic acid	131. million's reagent
100. silica gel 254	117. tween 80	132. methyl violet
101. sulphur	118. pure code liver oil	133. per chloric acid 70%
102. resorcinol	119. coco nut oil	134. fluorescein sodium
103. talc	120. hydroxyl amine hydrochloride	135. urea
104. acacia	121. di phenyl amine	136. Chloroform
105. bees wax	122. thyme oil	137. Nitric acid
106. calamine		138. N-hexane
107. bentonite		

### 13. Program Evaluation and Improvement

Evaluation Target	Evaluation period and tool	Samples
<b>Final year students</b>	Annual Questionnaire	50 % of the students number
<b>Program Graduates</b>	Every 2 years Questionnaire	50 % of the graduates number
<b>Employment entities</b>	Every 3 years (Questionnaire & Meeting)	<ul style="list-style-type: none"> <li>Supervisors of med. Representatives in a marketing Drug company.</li> <li>Manager of a local drug factory.</li> <li>Head pharmacist in a private hospital.</li> <li>Head pharmacist in a public hospital.</li> <li>Manager of the Quality control lab. in the supreme board of drugs.</li> </ul>





# **YEMEN UNIVERSITY**

## **Faculty of Medical sciences**

### **Department of pharmacy**

**2015**



## PHARMACY BACHELOR PROGRAM SPECIFICATION

### 1. Basic information on the program

Program name & scientific degree awarded	Pharmacy Bachelor
The entity awarding the degree	Medical sciences college
The academic department responsible for the program	Pharmacy department
Other departments participating in the program	Medical sciences faculty (Medical laboratory dept., applied medical sciences dept.), Computer sciences & IT faculty ( Computer sciences dept.,)
Language of the study	ENGLISH
The year of beginning the program	2015
Study order	Obligatory attendance (minimum 75 %)
Facility of program execution	The university
Study system	Semester type - Credit hours
Study duration	5 academic years consisting of 10 academic semesters
The profession for which the program prepares the students	Pharmacy
The levels intended for qualifications	High school students
Qualification required for admission	High school certificate
Required Qualification Score %	70 %
Other conditions	Date of High school degree does not exceed 5 years.
Program Coordinator	Ala`a M. Almaqtari and Anes Abdulwahid M. Thabit

### 2. Faculty mission and aims

#### MISSION

The faculty mission is to offer to its students a remarkable high education service in medical sciences that concerns with students` acquiring of scientific knowledge and skills that potentiate their capabilities to compete in work markets and make them a qualified medical staff able to lead and develop in medical work fields and creative and effective elements in their societies. The faculty also intends to contribute in progress of the medical scientific researches and to fulfill the community need to medical services.

#### AIMS

1. Rising & development of the medical high education and improvement of its outcomes .
2. Achieving superiority in academic , instructional and learning aspects of its



Bachelor & postgraduate programs .
3. Enhancing of the effectiveness of its teaching staff to augment the students` learning.
4. Potentiating the students` personal, social and academic development and their technological innovation to provide the community with capable medical staff able to offer high medical services.
5. Providing a safe, health and stable educational environment that encourages learning and creation in the college`s students and teaching staff.
6. Participation in accomplishing newer scientific additions for humanity knowledge in medical fields by supporting the scientific researches for the favor of the local, regional and international communities.
7. Augmentation of the relationship with the local, Arabic and international scientific institutions to improve the health states and solving the communities problems by supporting researches and providing consultation services.
8. Supporting the loyalty of the faculty`s graduates and also its academic and administrative staff.
9. Encouraging the graduates' compliance to professional ethics and their commitment to their communities.
10. Best utilizing of its material and human resources for the favor of the learning and instructional processes in order to achieve its mission and objectives.
<b>3. Mission &amp; Aims of the academic department</b>
<b>PHARMACY DEPARTMENT</b>
<b>MISSION</b>
Pharmacy department intends to offer to its students a remarkable high education service in pharmaceutical sciences that concerns with students` acquiring of scientific knowledge and skills that potentiate their capabilities to compete in work markets and make them a qualified medical staff able to lead and develop in pharmacy-related work fields and creative and effective elements in their societies. The college also intends to contribute in progress of the pharmaceutical researches and to fulfill the community need to pharmaceutical services.
<b>OBJECTIVES</b>
1. Rising & development of pharmacy high education and improvement of its outcomes .
2. Achieving superiority in academic , instructional and learning aspects of its Bachelor & postgraduate pharmacy programs
3. Enhancement of the effectiveness of its teaching staff to augment the students` learning.



4. Potentiating of the students` personal, social and academic development and their technological innovation to provide the community with capable pharmacists able to offer high pharmaceutical services.
5. Providing a safe, health and stable educational environment that encourages learning and creation in the college`s students and teaching staff.
6. Participation in accomplishing newer scientific additions for humanity knowledge in pharmacy by supporting the scientific researches for the favor of the local, regional and international communities.
7. Augmentation of the relationship with the local, Arabic and international pharmaceutical institutions to improve medications and solving the communities problems by supporting researches and providing consultation services.
8. Supporting the loyalty of the graduates and its academic and staff.
9. Encouragement of the graduates' compliance to pharmacy professional ethics and their commitment to their communities.

#### **4. Program`s mission**

The program intends to offer remarkable curriculum in pharmacy characterized with modernity and comprehension and focusing on development of both the knowledge and skill aspects of students in order to ensure graduation of highly qualified pharmacists who are able to provide high pharmaceutical services to their communities.

#### **5. Program AIMS**

1. Providing the students with scientific knowledge in basic sciences and pharmaceutical sciences including the modern ones that are essential to realize their duties and activities as pharmacists.
2. Developing the intellectual, professional and practical skills of the students to make them able to perform all types of pharmacy-related works.
3. Enhancing the transferable skills of the students to perform pharmacy profession with respect to their colleagues, patients and community and in compliance to the profession ethics and laws.

#### **6. Program References**

- Regulations provided by the council of quality assurance and academic accreditation – Ministry of High education & scientific research, Yemen.
- Standards of the Accreditation Council for Pharmacy Education (ACPE), 2013
- Similar Pharmacy BC programs awarded by regional and international universities and have been accredited by ACPE, including :
  - Sana'a university, Yemen
  - King Saud university, Saudi Arabia





- Qatar University, Qatar
- Beirut University, Lebanon
- Pharma Alberta university , USA

## 7. Intended learning outcomes (ILOs) of the program

### Basic Intended learning outcomes (ILOs)

At the end of this program, the graduates shall have been able to :

<b>ILOs of knowledge &amp; understanding</b>	Recognize the scientific principles and technologies needed for practicing of pharmacy profession.
<b>ILOs of intellectual skills</b>	Analyze, apply, synthesize and evaluate information and concepts in various pharmacy –related works.
<b>ILOs of practical &amp; professional skills</b>	Practice pharmacy-related works safely and effectively.
<b>ILOs of transferable skills</b>	Influence positively in team work and consider ethics & laws during practicing of his/her profession& commit to serve patients & community

## 8. Curriculum Map

### Subsidiary Intended learning outcomes (ILOs)

#### ILOs of knowledge & understanding

- A1.** Understand the current missions, duties and carriers of pharmacists as professionals and the related pharmaceutical sciences and the historical progress of the profession.
- A2.** Know the structures and biological processes& functions of different parts in living organisms including those in human body& sources/causes & mechanisms of diseases.
- A3.** Understand the sources of matters (including drugs), their physicochemical, pharmaceutical, biological (therapeutic and toxicological) properties and how they interact with other matters.
- A4.** Recognize the basis of drug therapy (designing and monitoring) and its cost-effectiveness and the alternative therapy methods.
- A5.** Understand the, basic, modern and advanced pharmacy work principles and technologies applied for dosage forms formulation, analyzing drugs, understanding drug effects, searching for new drugs , applying new therapies and designing drug delivery systems.
- A6.** Understand the basics and rules of speech, reading and writing in the healthcare fields.

#### ILOs of intellectual skills

- B1.** Use various logic mental processes such as calculation, explanation, description, conclusion, and others in dealing with various phenomena/problems related to pharmacy works.
- B2.** Compare, differentiate and distinguish between related entities, phenomena and concepts and classify various entities based on certain properties.



<b>B3.</b> Bind phenomena, laws or equations to their affecting factors. In addition, how these change by enhancing or inhibiting of such factors.
<b>B4.</b> Determine the source of errors/problems and work to solve them.
<b>ILOs of practical &amp; professional skills</b>
<b>C1.</b> Handle, operate & run different tools, instruments and equipments involved in pharmacy works in drug plants, research & development centers, quality control departments and hospital, clinical and community pharmacies.
<b>C2.</b> Apply theoretical knowledge in performing different types of pharmacy works.
<b>C3.</b> Commit to standard operation procedures (SOPs) and safety criteria during practicing pharmacy works in Laboratories, hospitals, pharmacies and drug factories.
<b>C4.</b> Effectively & correctly use language grammars & fundamental skills (reading, writing and speech) , and the media and information sources (books, internet websites, computer programs) to present thoughts/ideas and to search for information
<b>ILOs of Transferable skills</b>
<b>D1.</b> Share successfully in teamwork & reporting activities.
<b>D2.</b> Show respect to life and commit to community serving.
<b>D3.</b> Communicate effectively with his/her colleagues, members of health care team, patients and other people.
<b>D4.</b> Comply to pharmacy laws and ethics and behave in discipline during practicing pharmacy works



No	Courses (ordered as appeared in the study plane)	Subsidiary ILOs																	
		A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
1.	Arabic language														√			√	
2.	English language 1						√		√						√			√	
3.	Introduction of computer sciences											√			√				
4.	Islamic culture																√		√
5.	Introduction to pharmacy history	√				√			√										
6.	General Biology		√						√			√		√		√	√	√	√
7.	General chemistry			√				√		√		√		√		√		√	√
8.	Pharmaceutical Organic chemistry 1		√												√	√		√	
9.	Pharmaceutical Organic chemistry 2			√				√		√		√		√		√		√	√
10.	Biophysics Physical pharmacy							√	√		√								
11.	Pharmaceutical analytical chemistry 1						√		√	√					√			√	√
12.	Medical terminology			√				√	√	√	√	√		√		√			
13.	Human Anatomy		√						√			√		√		√	√	√	√
14.	Public health and First aid	√		√		√													
15.	Human Histology		√	√		√		√	√	√	√	√		√		√		√	√
16.	Pharmaceutical Biochemistry 1								√								√		√
17.	Human Physiology I		√	√				√	√								√		
18.	General Pharmacognosy 1			√				√	√	√	√	√		√		√		√	√
19.	Pharmaceutics 1		√	√					√	√		√		√			√	√	√
20.	Pharmaceutical Organic chemistry 2		√	√				√				√		√		√	√	√	√
21.	Pharmaceutical analytical chemistry 2	√						√			√			√		√			
22.	Pharmaceutical Biochemistry 2		√	√				√	√								√		
23.	Human Physiology 2	√		√		√		√	√	√	√	√		√		√		√	√
24.	Pharmaceutics 2			√		√		√	√		√	√		√		√	√		
25.	General Pharmacognosy 2	√	√	√		√		√	√			√		√		√	√	√	√
26.	Instrumental analysis		√	√		√			√	√	√	√		√		√	√	√	√
27.	Pharmaceutical microbiology 1		√	√				√	√								√		
28.	Pharmaceutical			√		√		√	√	√	√			√		√		√	√



No	Courses (ordered as appeared in the study plane)	Subsidiary ILOs																	
		A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
	microbiology 2																		
29.	Pharmacology 1	√	√	√	√	√		√	√	√							√		
30.	Bonty and medicinal plants			√		√		√	√	√	√			√			√	√	√
31.	Pharmaceutics 3	√		√		√		√	√	√	√	√		√		√		√	√
32.	Phytochemistry 1		√	√		√			√	√	√	√		√		√	√	√	√
33.	Pharmacology 2	√	√	√	√	√		√	√	√							√		
34.	Pathology	√	√	√		√		√	√			√		√		√	√	√	√
35.	Pharmaceutical Medicinal chemistry 1		√	√				√	√								√		
36.	Pharmaceutical Quality control	√		√		√		√	√	√	√	√		√		√		√	√
37.	Biopharmacy&pharmac okinetics 1	√		√		√		√	√			√		√		√		√	√
38.	Parasitology	√	√	√	√	√		√	√	√							√		
39.	Biopharmacy&Pharmac okinetics 2	√		√		√		√	√	√	√	√		√		√		√	√
40.	Phytochemistry 2	√	√	√	√				√	√	√						√		
41.	Pharmaceutical biotechnology	√	√	√	√	√		√	√	√	√	√		√		√	√	√	√
42.	Industrial pharmacy 1	√	√	√	√	√		√	√	√	√	√		√	√	√	√	√	√
43.	Industrial pharmacy 2	√	√	√	√	√		√	√	√	√	√		√	√	√	√	√	√
44.	Pharmaceutical Medicinal chemistry 3	√	√	√	√	√		√	√	√	√	√	√	√	√	√		√	√
45.	Pharmacology 4	√	√		√			√	√		√						√	√	√
46.	Pharmaceutical Medicinal chemistry 2	√	√	√	√	√			√	√	√	√		√		√	√	√	√
47.	Toxicology & forensic medicine	√	√		√			√	√		√				√	√	√	√	√
48.	Clinical biochemistry	√	√	√	√	√		√	√	√	√	√		√		√		√	√
49.	Applied pharmacognosy 1	√	√		√			√	√		√				√	√	√	√	√
50.	Community Pharmacy& pharmacy practice	√		√	√	√		√	√	√	√	√		√		√	√		√
51.	Field training 1	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√
52.	Applied pharmacognosy 2	√	√	√	√	√		√	√	√	√						√		√
53.	Pharmacology 3	√	√	√		√		√	√	√	√	√		√		√	√	√	√
54.	Scienc & technology of cosmetic production	√	√	√	√	√		√	√								√		√
55.	Psycho-sociology for health professional	√		√	√	√		√	√		√	√	√	√		√	√	√	√





No	Courses (ordered as appeared in the study plane)	Subsidiary ILOs																	
		A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
56.	Advanced molecular biology	√		√	√	√		√	√			√		√		√	√	√	√
57.	Professional & Hospital pharmacy	√		√		√		√	√	√	√	√		√		√	√	√	√
58.	Field training 2	√	√	√	√	√		√	√		√				√	√	√	√	√
59.	Pharmaceutical Medicinal chemistry 4	√	√	√	√	√		√	√	√	√	√		√		√	√		√
60.	Biostatistics & Research methodology techniques	√	√	√	√	√		√	√		√				√	√	√	√	√
61.	Clinical pharmacy 2	√	√	√	√	√		√	√		√	√	√	√		√	√	√	√
62.	Pharmaceutical Biochemistry 3		√		√			√	√		√						√		
63.	Pharmaceutics 4	√	√	√	√	√		√	√	√	√	√	√	√		√	√	√	√
64.	Management of drug side effect	√	√	√	√	√		√	√	√	√						√		
65.	Community medicine	√	√	√	√	√		√	√	√							√	√	
66.	Pharmacy Law and Ethics	√			√			√	√									√	
67.	Drug marketing & advertisement	√						√	√		√	√	√	√	√	√	√	√	√
68.	Clinical pharmacy 1	√	√	√	√			√	√	√	√	√	√	√	√	√	√	√	√
69.	Graduation Research							√	√		√	√	√	√	√	√		√	√
70.	Advanced Medical terminology							√	√		√	√	√	√	√	√		√	√
71.	English language 2						√	√	√		√	√	√	√	√	√		√	√
72.	Pharmaceutical business administration		√	√	√	√		√	√	√						√	√	√	



## 9. Teaching strategies

Teaching strategy	How to be used?
<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.</p> <p>The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>	<p>This is the most frequently employed teaching method in the program. It is to convey knowledge and explain theories to students. The efficiency of lecturing should be enhanced by using techniques such as Brain-storming: It depends on stimulation of the student's brain through a group of questions or Concepts mapping: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations and other techniques or by using learning aids such as Data show projector, Intelligent board and models</p>
<p><b>lecture - Discussion</b>: a short lecture/ address followed by discussion</p>	<p>one of the widely spread method of interactive studying. The process of discussion raises the quality of participation and activity of students. This process isn't limited only to questions asked by professor. This method develops the ability of conformation ones' own idea and discussion</p>
<p><b>Seminars</b>: these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.</p>	<p>Presentation of some topics in pharmaceutical sciences using Data show projector and power point program</p>
<p><b>IT laboratory sessions</b>: average number of students in session(20-30) students</p>	<p>During the process of study and especially during laboratory lessons student is making technology processes independently by using appropriate</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>	<p>Experimental Lab. For all pharmaceutical sciences</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>	<p>Used during pharmaceutical sciences studies and "<b>Graduation research</b> " courses.</p>
<p><b>Field training</b>: each 2-3 students are commissioned to do certain assignments in a real field entity such as drug factory, hospitals, pharmacies under supervision of both the field principle and an academic supervisor</p>	<p>Pharmaceutical training (576 total actual training hours in 24 weeks) practically 6 months which equal 144 total credit hours..</p> <p>Training must be done in pharmacies of private and governmental hospitals, pharmacies, pharmaceutical industrial companies and accepted by the college. During the training period, students are supervised and evaluated</p>



	by the college staff members in collaboration with the pharmacy supervisor. B. Pharm. Sc. Degree will be awarded only after acceptance of the student report and evaluation.
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## 10. Students Assessment strategies

### Assessment Rules

- (i) No students is allowed to enter the final exam unless he/she has attended at least 75 % of the total number of course lectures/practical sessions.
- (ii) For courses that involve practical parts, the student will not pass the course unless he/she passes both theoretical and practical course parties
- (iii) The student will not pass the course unless he/she gain theoretical and practical course parties
- (iv) The minimum pass degree in the final theoretical exam is 30 % of the estimation weight of the exam.
- (v) The minimum pass degree in the final practical exam is 30 % of the estimation weight of the exam.
- (vi) The student will pass the course if he/she gains at least 50 % of the total the estimation weight of the course.

### Assessment Methods

#### Description of methods

Assessment method	Description & courses
Written exam	<ul style="list-style-type: none"> <li>Will be used in most courses</li> <li>Closed-book pattern</li> </ul>
Oral exam	<ul style="list-style-type: none"> <li>Will be used in courses involving practical parts e.g. "General chemistry"</li> <li>Will be used in used in " Pharmacy training " courses where a specialized committee will implement the exam</li> </ul>
Assignments	<ul style="list-style-type: none"> <li>The student will be assigned to do homework paper, search, charts etc related to the course topics</li> <li>Used in most courses</li> </ul>
Quiz	<ul style="list-style-type: none"> <li>A predefined timed brief questions will be asked to be answered by the students</li> </ul>
Attendance	<ul style="list-style-type: none"> <li>Will be used in all courses</li> <li>Students will be informed that no one will attend the final exams unless he/she attends at least 75 % of the lectures and lab. practices (if any)</li> <li>Attendance degree will be based on the number of the lectures / lab. sections the student has attended.</li> </ul>
Reporting	<ul style="list-style-type: none"> <li>Will be used in courses including practical parts and also courses related to filed training</li> </ul>



Attitude	<ul style="list-style-type: none"> <li>A predefined template will be asked to filled by the student</li> <li>Will be used in courses including practical parts and also courses related to filed training</li> <li>Teachers of the lab. practice will instruct students of to follow standard procedures for safety lab works. Teachers will also inform students that they will evaluate their lab. attitude.</li> </ul>
Pharmacy training Exams	<ul style="list-style-type: none"> <li>40 % of the course degree will be based on attendance, attitude and reporting and implanted by the training supervisor</li> <li>60 % of the course degree will be based on oral exam implemented by specialized committee.</li> </ul>
Graduation research project exam	<ul style="list-style-type: none"> <li>40 % of the course degree will be implanted for each student by the project supervisor based on attendance and attitude</li> <li>60 % of the course degree will be implanted by a specialized committee for the whole students of the project based on research methodology, writing, presentation and discussion</li> </ul>

### More details of assessment method

#### 1.For courses involving no practical part

Item	Weight	Schedule
Attendance	5%	15 <sup>th</sup> week
Assignments and Quizzes	15 %	5 <sup>th</sup> and 12 <sup>th</sup> week
Mid-term exam (Writing)	20%	7 <sup>th</sup> or 8 <sup>th</sup> week
Final-exam (Writing)	60 %	16 <sup>th</sup> -17 <sup>th</sup> week
Total Weight of the Course	100 %	

#### 2.For courses involving a theoretical and practical parts

##### Theoretical part

Item	Weight	Schedule
Attendance	5 %	15 <sup>th</sup> week
Assignments and Quizzes	5 %	5 <sup>th</sup> and 12 <sup>th</sup> week
Mid-term exam (Writing)	10 %	7 <sup>th</sup> or 8 <sup>th</sup> week
Final-exam (Writing)	40 %	16 <sup>th</sup> -17 <sup>th</sup> week
Total Theory. Weight	60 %	

##### Practical part

Item	Weight	Schedule
Attendance	5 %	11 <sup>th</sup> week
Lab. Attitude	5 %	Weekly ; average
Reporting	5 %	Weekly; average
Final exam (theory or oral )	5 %	11 <sup>th</sup> week
Final exam (practical)	20 %	11 <sup>th</sup> week
Total Practical Weight	40 %	* : of the weight of the exam
Total Weight of the Course	100 %	

#### 3. Pharmacy training assessment





Items	Weight
Attendance	10 %
Attitude	10 %
Reporting	20 %
Final exam by committee*: Writing & Oral exam	60 %
<b>Total</b>	<b>100</b>
* : A committee of three of the teaching staff including the teacher supervisor of the training.	
<b>4. Graduation project assessment</b>	
<b>Each project will be assessed by a committee of three member as follows</b>	
Items	Weight
Project supervisor	70 %
Internal examiner : a member of the department teaching stuff.	15 %
external examiner : a qualified external examiner (either from other departments of the college or from another university)	15 %
<b>Total</b>	<b>100</b>
<b>Assessment of the project by the project supervisor</b>	
Items	Weight
Attendance	50 %
Attitude and collaboration	50%
<b>Total</b>	<b>100 %</b>
<b>Assessment of the project by the other discussion member<sup>1</sup></b>	
Items	Weight
Research methodology	30 %
Research writing	30 %
Presentation	25 %
Discussion	15 %
<b>Total</b>	<b>100 %<sup>2</sup></b>
<sup>1</sup> : The whole students team of the projects will be assessed as one	
<sup>2</sup> : to be converted to 15% for each examiner.	
<b>Seminar Courses assessment</b>	
Items	Weight
Seminar	40 %
Final written exam	60 %
<b>Total</b>	<b>100</b>
<b>The seminar weight will be assessed (for the students group as one unit) as follows:</b>	
Items	Weight
Presentation	10 %
Solving of the Case study questions	20 %
Discussion	10 %
<b>Total</b>	<b>40 %</b>



Description of grades			
Table of grades description			
Grade percentage %		Description	
90 – 100 %		Excellent	
80- 90 %		Very Good	
65- 80 %		Good	
50 –65 %		Pass	
<ul style="list-style-type: none"><li>Grade percentage with fractions greater than or equal 0.5 will be raised directly to the higher grade</li><li>The Table of grades description is used to describe course grade, semester grades , annual grades and overall grade</li></ul>			
Semester Grades %			
<ul style="list-style-type: none"><li><b>Credit Course grade</b> = courses grade percentage x credit hours of the course</li><li><b>Semester grade %</b> = cumulative credit courses degrees in the semester / total credit hours of the semester courses</li></ul>			
Annual Grades %			
<b>Annual grade %</b> = cumulative credit courses grades in the two semesters of the year / total credit hours of courses in the two semesters of the year.			
Overall Grade %			
<b>Overall grade</b> = cumulative credit courses grades in the five years / 172 Where, 172 is the total credit hours of courses in the five years of the study			
Credit academic Hours			
Academic year	Credit hours		Annual Total
	First semester	Second semester	
	Total	Total	
1 <sup>st</sup>	15	16	31
2 <sup>nd</sup>	19	18	37
3 <sup>rd</sup>	16	14	30
4 <sup>th</sup>	18	19	37
5 <sup>th</sup>	19	18	37
Total	88	85	172



11. Study system & Courses			
Study Type and duration		Semester-based ; 5 academic years (levels), 10 academic semesters ; each semester is composed of 16 weeks (including exams periods).	
Total credit hours to accomplish the study		172	
Distribution of the total study credit hours			
Requirements		Number of courses and credit hours and %	
University requirement		5 courses ; 10 credit hours	
Faculty requirements		10 courses ; 24 credit hours	
Academic department requirements (essential requirements)		15 courses ; 34 credit hours	
Academic department requirements (General Obligatory Specialty requirements)		40 courses ; 100 credit hours	
Academic department requirements (Field training)		2 courses ; 4 credit hours	
Academic department requirements (optional Specialty requirements)		None	
Total		72 courses ; 172 credit hours	
Courses Per Requirement			
1. Courses required by the university			
No.	Code	Course	Credit hours
1.		Arabic language	2
2.		English language 1	2
3.		English language 2	2
4.		Introduction of computer sciences	2
5.		Islamic culture	2
Total			10
2. Courses required by the faculty			
No.	Code	Course	Credit hours
1.		General Biology	2
2.		General chemistry	3
3.		Pharmaceutical Organic chemistry 1	3



4.		Pharmaceutical Organic chemistry 2	3
5.		Pharmaceutical Organic chemistry 3	3
6.		Medical terminology	2
7.		Public health and First aid	2
8.		Biostatistics & Research methods & techniques	2
9.		Graduation Research	2
10.		Advanced Medical terminology	2
<b>Total</b>			<b>24</b>
<b>3. Courses required by the Department</b>			
<b>a. Essential required courses</b>			
No.	Code	Course	Credits hours
1.		Introduction to pharmacy history	2
2.		Community medicine	2
3.		Pharmacy Law and Ethics	2
4.		Pharmaceutical analytical chemistry 1	3
5.		Pharmaceutical analytical chemistry 2	3
6.		Biophysics & Physical pharmacy	2
7.		Human Anatomy	3
8.		Human Histology	2
9.		Human Physiology 1	2
10.		Human Physiology 2	2
11.		Bonty and medicinal plants	2
12.		Advanced molecular biology	2
13.		Psycho-sociology for health professional	2
14.		Pathology	2
15.		Parasitology	3
<b>Total</b>			<b>34</b>
<b>Specialty courses (obligatory &amp; field training)</b>			
<b>Pharmaceutics and Pharmacy practice courses</b>			





No.	Code	Course	Credits hours
1.		Pharmaceutics 1	3
2.		Pharmaceutics 2	3
3.		Pharmaceutics 3	3
4.		Pharmaceutics 4	3
5.		Biopharmaceutics & Pharmacokinetics 1	2
6.		Biopharmaceutics & Pharmacokinetics 2	2
7.		Pharmaceutical biotechnology	2
8.		Industrial pharmacy 1	2
9.		Industrial pharmacy 2	2
10.		Pharmaceutical Quality control	2
11.		Pharmaceutical microbiology 1	3
12.		Pharmaceutical microbiology 2	3
13.		Drug marketing and advertisement	2
<b>Total</b>			<b>32</b>
<b>Pharmaceutical chemistry and related courses</b>			
14.		Pharmaceutical Medicinal chemistry 1	3
15.		Pharmaceutical Medicinal chemistry 2	3
16.		Pharmaceutical Medicinal chemistry 3	3
17.		Pharmaceutical Medicinal chemistry 4	3
18.		Instrumental analysis	2
19.		Pharmaceutical business administration	2
20.		Pharmaceutical Biochemistry 1	3
21.		Pharmaceutical Biochemistry 2	3
22.		Science & technology of cosmetic production	2
23.		Pharmaceutical Biochemistry 3	3
<b>Total</b>			<b>27</b>
<b>Pharmacognosy and related courses</b>			
24.		General pharmacognosy 1	3
25.		General pharmacognosy 2	3
26.		Phytochemistry 1	3
27.		Phytochemistry 2	3



28.		Applied pharmacognosy 1	3
29.		Applied pharmacognosy 2	3
<b>Total</b>			<b>18</b>
<b>Pharmacology and related courses</b>			
30.		Pharmacology 1	2
31.		Pharmacology 2	2
32.		Pharmacology 3	2
33.		Pharmacology 4	2
34.		Toxicology & forensic medicine	2
<b>Total</b>			<b>10</b>
<b>Clinical Pharmacy and Pharmacy practice courses</b>			
35.		Management of drug side effects	2
36.		Field training 1	2
37.		Field training 2	2
38.		Clinical pharmacy 1	3
39.		Clinical pharmacy 2	3
40.		Clinical biochemistry	2
41.		Professional & hospital pharmacy	2
42.		Community Pharmacy & pharmacy practice	2
<b>Total</b>			<b>18</b>
<b>Overall Total</b>			<b>172</b>



STUDY PLAN									
FIRST YEAR									
First semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Arabic language		university	2	-	-	-	2	
2	English language 1		university	2	-	-	-	2	
3	Introduction of computer sciences		university	2	-	-	-	2	
4	Medical terminology		Faculty	2	-	-	-	2	
5	Introduction to pharmacy history		Essential	2	-	-	-	2	
6	General Biology		Faculty	2	-	-	-	2	
7	General chemistry		Faculty	2	1	-	-	3	
Total				14	1	-	-	15	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING

FIRST YEAR									
Second semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutical Organic chemistry 1		Faculty	2	1	-	-	3	
2	Islamic culture		university	2	0	-	-	2	
3	Biophysics & Physical pharmacy		Essential	2	-	-	-	2	
4	Pharmaceutical analytical chemistry 1		Essential	2	1	-	-	3	
5	Advanced Medical terminology		Faculty	2	0	-	-	2	
6	Bonty and medicinal plants		Essential	2	-	-	-	2	
7	English language 2		university	2	-	-	-	2	
Total				14	2	-	-	16	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING



SECOND YEAR									
First semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Human anatomy		Essential	2	1	-	-	3	
2	Parasitology		Essential	2	1	-	-	3	
3	Human Physiology 1		Essential	2	0	-	-	2	
4	Instrumental analysis		Specialty	2	-	-	-	2	
5	Pharmaceutics 1		Specialty	2	1	-	-	3	
6	Pharmaceutical Organic chemistry 2		Faculty	2	1	-	-	3	
7	Pharmaceutical analytical chemistry 2		Essential	2	1	-	-	3	
Total				14	5	-	-	19	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING

SECOND YEAR									
Second semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutical Biochemistry 1		Specialty	2	1	-	-	3	
2	Human Physiology 2		Essential	2	0	-	-	2	
3	Pharmaceutics 2		Specialty	2	1	-	-	3	
4	Human histology		Essential	2	-	-	-	2	
5	Pharmaceutical microbiology 1		Specialty	2	1	-	-	3	
6	Pathology		Essential	2	0	-	-	2	
7	Pharmaceutical Organic chemistry 3		Faculty	2	1	-	-	3	
Total				14	4	-	-	18	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING





THIRD YEAR									
First semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutical microbiology 2		Specialty	2	1	-	-	3	
2	Pharmaceutics 3		Specialty	2	1	-	-	3	
3	General pharmacognosy 1		Specialty	2	1	-	-	3	
4	Pharmaceutical Biochemistry 2		Specialty	2	1	-	-	3	
5	Pharmacy law and ethics		Essential	2	-	-	-	2	
6	Community medicine		Essential	2	-	-	-	2	
Total				12	4	-	-	16	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING

THIRD YEAR									
Second semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutics 4		Specialty	2	0	-	-	2	
2	Professional & hospital pharmacy		Specialty	2	-	-	-	2	
3	Public health & first aid		Faculty	2	0	-	-	2	
4	Pharmaceutics 3		Specialty	2	1	-	-	3	
5	Psycho-sociology for health professional		Essential	2	0	-	-	2	
6	Pharmaceutical Biochemistry 3		Specialty	2	1	-	-	3	
Total				12	2	-	-	14	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING



FOURTH YEAR									
First semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutical Medicinal chemistry 1		Specialty	2	1	-	-	3	
2	Pharmacology 1		Specialty	2	0	-	-	2	
3	Phytochemistry 1		Specialty	2	1	-	-	3	
4	Pharmaceutical business administration		Specialty	2	0	-	-	2	
5	Clinical biochemistry		Specialty	2	0	-	-	2	
6	Biopharmacy & pharmacokinetics 1		Specialty	2	-	-	-	3	
7	Community Pharmacy & pharmacy practice		Specialty	2	0	-	-	2	
8	Advanced molecular biology		Essential	2	0	-	-	2	
Total				16	2			18	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING

FOURTH YEAR									
Second semester									
No	Course	Code	Courses - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutical Medicinal chemistry 2		Specialty	2	1	-	-	3	
2	Pharmacology 2		Specialty	2	0	-	-	2	
3	Phytochemistry 2		Specialty	2	1	-	-	3	
4	Clinical pharmacy 1		Specialty	2	1	-	-	3	
5	Pharmaceutical biotechnology		Specialty	2	0	-	-	2	
6	Biopharmacy & pharmacokinetics 2		Specialty	2	0	-	-	2	
7	Management of drug side effects		Specialty	2	0	-	-	2	
8	Field training 1		Specialty	0	0	-	2	2	
Total				14	3		2	19	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING



FIFTH YEAR									
First semester									
No	Course	Code	Coures - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmaceutical Medicinal chemistry 3		Specialty	2	1	-	-	3	
2	Pharmacology 3		Specialty	2	0	-	-	2	
3	Sciene & technology of cosmetic production		Specialty	2	0	-	-	2	
4	Clinical pharmacy 2		Specialty	2	1	-	-	3	
5	Applied pharmacognosy 1		Specialty	2	1	-	-	3	
6	Toxicology & forensic medicine		Specialty	2	0	-	-	2	
7	Industrial pharmacy 1		Specialty	2	0	-	-	2	
8	Field training 2		Specialty	0	0	-	2	2	
Total				14	3		2	19	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING

FIFTH YEAR									
Second semester									
No	Course	Code	Coures - required type	Credit hours					Pre-request
				L	P	S	TR	Total	
1	Pharmacology 4		Specialty	2	0	-	-	2	
2	Applied pharmacognosy 2		Specialty	2	1	-	-	3	
3	Biostatistics & research methods & techniques		Faculty	2	0	-	-	2	
4	Industrial pharmacy 2		Specialty	2	0	-	-	2	
5	Drug marketing and Advertisment		Specialty	2	0	-	-	2	
6	Pharmaceutical quality control		Essential	2	0	-	-	2	
7	Pharmaceutical Medicinal chemistry 4		Specialty	2	1	-	-	3	
8	Graduation Research		Faculty	0	2	-	-	2	
Total				14	4		-	18	

L : THEORETICAL , P: PRACTICAL , S : SEMINAR ; TR.: TRAINING



Training Plan for PB Program (Actual 576 hrs)					
Fifth Year (9 <sup>th</sup> Semester) (8 Week) (192hrs)			Fourth Year (8 <sup>th</sup> Semester) (16 Week) (384 hrs)		
Training Hours	Course Name	Week No.	Training Hours	Course Name	Week No.
96hrs	Field Training in Pharmaceutical Products Manufacturing	1-4	96 hrs	Field Training in Governmental Pharmacies	1-4
			96hrs	Field Training in Governmental Hospital Pharmacies	5-8
			96 hrs	Field Training in Private Hospital Pharmacies	9-12
96 hrs	Field Training in Community Pharmacy & Medical Supply	5-8	96hrs	Field Training in Private Pharmacies	13-16
24	Training Total & Actual Hours/Week)		24	Training Total & Actual Hours/Week)	
4	(Training Total Credit Hours/Week)		4	(Training Total Credit Hours/Week)	

Academic year	Credit hours									
	First semester					Second semester				
	L	P	S	TR.	Total	L	P	S	TR	Total
1 <sup>st</sup>	14	2	-	-	15	14	2	-	-	16
2 <sup>nd</sup>	14	5	-	-	19	14	4	-	-	18
3 <sup>rd</sup>	12	4	-	-	16	12	2	-	-	14
4 <sup>th</sup>	16	2			18	14	3		2	19
5 <sup>th</sup>	14	3		2	19	14	4		-	18
Total	70	15	2	4	91	71	16	4	2	90





## 12. Admission & Registration requirements

- 1- The original certificate of secondary school graduation – scientific department- with at least 75 % overall performance grade associated with an authorial stamped copy of the certificate.

\*For certificates from outside Yemen, they must be translated (if not in Arabic language) and approved by authority entities in Yemen.

- 2- Registration fees
- 3- A photocopy of personal or family identity card.
- 4- 10 frontal personal photocopies with a white background.
- 5- A copy of the first 8 pages of the passport (for non-Yemeni students)  
The passport should be valid for at least one year to come.
- 6- A copy for health fitness certificate (for non-Yemeni students)

### Procedure for registration

Application for admission and registration should be done at the times specified by the university. The person who desire to admit this program should do the following :

1. Review the study system, regulations and the admission requirements (he/she can get a copy from the unit of admission and registration (UAR) in the university).
2. Review the admission application papers offered by the university, fill it by him/herself, and deliver it to the (UAR) in the university.
3. Deliver all the required certificates and papers required for admission to the UAR.
4. The administration of the UAR will revise the applier delivered papers to ensure their validation.
5. The UAR inform of the applier that his/her application is accepted/rejected.
6. If the application is accepted. He/she must pay the registration fee and deliver him/her a receipt for that.

## 14. Requirements of attendance and program accomplishment

The followings are ONLY basic terms that regulate the study in this program. Other important terms are delivered by the UAR to those who want to admit this program.

### **General regulations**

- The student who is regressed in this program will not be allowed to register in another program of the same faculty at the same time.

### **Attendance**

- Attendance of the student is obligatory in this program.
- At least he/she must attend at least 75 % of the study in both parts (theoretical and practical , if any)
- The student who fails to attend 75 % of each part will not be allowed to enter the final exams and will be considered "Failed" in the course. He/she also will not be allowed to attend the complementary



exam either.

### Proceeding to next levels

- The student will processing to the next level (academic year) of the study if he/she passes all the level courses.
- After performing the final exams and the complementary exams:
  - The student who has failed in two courses (in that level or in the previous levels) can proceed to the next level only if one of these courses is a university-required course.
  - The student who has failed in three courses (in that level or in the previous levels) can proceed to the next level only if one of these courses is a university-required course.
  - If the student failed in a non-practical based course, he has no need to attend that course in the next year.
  - If the student failed in a practical based course, he has to attend the whole course again (both theoretical and practical part of the course) in the next year.
  - The student who has passed a course will not be allowed to re-study that course again.

### Outage and suspension of the study

#### The study outage

- The study outage is a state when the student stopped attending the study and has not deliver a request to suspend it. The outage period allowed is maximum of three academic years.
- The new curriculum (if any) of the program is applied to the outage student when he/she re-joins the study.

#### Suspension of the study

- The maximum allowed period of suspension is a maximum of two academic years or four academic semesters either consecutive or not.
- The new curriculum (if any) of the program is applied to the suspending student when he/she re-joins the study.
- The student whom wants to suspend the study must himself/herself (or a person authorized by him/her) deliver a written request to the dean of the faculty associated with a reasonable excuse for suspension.
- If the first semester has started, it is not permitted to accept requests of suspension.

### Withdrawal from the study

- The student whom wants to withdraw from the study must himself/herself (or a person authorized by him/her) deliver a written request to the dean of the faculty.
- He/she must pay all financial fees of the study and must be free from demands from all related units of the university.

## 11. Graduation requirements

Requirement	Details
<b>Total number of courses and credit hours required for graduation</b>	<ul style="list-style-type: none"> <li>• A total of 72 course of a total of 172 credit hours</li> </ul>



<b>Total number of actual field training hours required for graduation</b>	<ul style="list-style-type: none"> <li>• 576 actual training hours</li> </ul>
<b>Minimum grade for success in every course</b>	<ul style="list-style-type: none"> <li>• The minimum grade percentage is 50 %.</li> <li>• With conditions that the student must Attain at least 30 % of the degree of: <ul style="list-style-type: none"> <li>○ The final theoretical exam</li> <li>○ The final practical exam</li> <li>○ The committee degree for graduation pharmacy field training courses.</li> </ul> </li> </ul>
<b>Minimum grade for success in the program</b>	<ul style="list-style-type: none"> <li>• The minimum grade percentage is 50 % and the minimal grade is (pass).</li> </ul>

## 12. Resources required to execute the program

### a. Learning sources

The program has the following learning sources

Learning source	Sections	Detail
<b>White Boards</b>	All	At least One at each classroom
<b>Library</b>	Office equipments	Reading tables, Computer tables, chairs , Shelves for books and periodicals
	Books and Periodicals	suitable number of books and periodicals that comprehend all courses
	Electronic Books	the library computers will be supplied with a variety number of electronic books and CDs that comprehend a lot of courses
<b>Information technology sources</b>	Computer desktops	( 6 computers at the library and 40 at the computer lab.)
	Data show projectors	Each classroom has one
	Printers	(1) at the library , (1) at the computer lab, (1) at the photocopy services center
	Photocopy machine	(1) at the library , (1) at the photocopy services center
	Scanner	(1) at the library , (1) at the computer lab, (1) at the photocopy services center
	Flash memory cards (6 G) and CDs	Suitable amounts at the library (1) at the photocopy services center
	Internet links	(1) at the library , (1) at the computer lab
	Wireless networks	In the middle of the faculty

### b. Laboratories

#### 1. Number and names of labs

No.	Lab. Name
-----	-----------



1.	Pharmaceutics Lab.	
2.	Pharmacognosy & Phytochemistry Lab.	
3.	Pharmaceutical Chemistry Lab	
4.	Clinical and Biomedical Lab.	
5.	Parasitology & Microbiology Lab.	
6.	Anatomy & Histology Lab.	
7.	Virtual Pharmacy	
8.	Computer Lab.	
c. Tools & Equipments		
1. Essential tools:		
Filter papers	Test-tubes and holders	Burettes
Glass rods	Conical flasks	Funnels
Separating funnels	Calibrated flasks	Beakers
Measuring volumetric cylinders	Pipettes	Package Bottles
Microscopic slides	Washing bottles	Syringes
Spoons	Spatulas	stands
• These tools of different sizes should be available in each lab (if necessary) and in a suitable numbers as being required.		
2. Essential instruments :		
1. <b>Electronic balances:</b> (appropriate number in each Lab. at least one of them reads two digits).		
2. <b>Thermometers :</b> whenever necessary and in suitable amounts		
3. <b>Bunsen burners :</b> whenever necessary and in suitable amounts		
4. <b>First aid set:</b> one in each lab.		
5. <b>Safety chart of instruction:</b> one in each lab.		
6. <b>Fire extinguisher bottle:</b> one in each lab.		
7. <b>Air ventilation system :</b> Gas and vapor suction system : whenever necessary		
3. <b>EQUIPMENTS :</b> the major equipments required are :		
Pharmaceutics Lab.		
No.	Tool/ equipment name	Quantity
1.	Manual capsule fillers	1





2.	Homogenizer	2
3.	Centrifuge	1
4.	Sieves	10
5.	Digital pH Meter	1
6.	Suppository Mould	3
7.	Magnetic stirrer	2
8.	Melting point apparatus	1
9.	Water bath (6holes)	1
10.	Hot plate	1
11.	Tablet hardness tester	1
12.	Desiccators	1
13.	Tablet Coating – pan	1
14.	Clarity test apparatus	1
15.	UV/visible Spectrophotometer	1
16.	Moisture analyzer	1
17.	Refrigerator	1
18.	Thermometer	2
19.	Tablet single press	1
20.	US Sonnicator	1
21.	Mortar and pestle small in size	15
22.	Mortar and pestle medium in size	25
23.	Mortar and pestle large in size	25
24.	Spoon and spatula	15



25.	Beaker's holder	15
26.	Buchner funnel (various sizes)	5
27.	Water bath (6holes)	1
28.	Magnetic stirrer	2
29.	Shaker	1
30.	Dissolution apparatus	1
31.	Disintegration apparatus	1
32.	Hardness digital tester	1
33.	Friability tester	1
<b>Pharmacognosy &amp; Phytochemistry Lab</b>		
No.	Tool/ equipment name	Quantity
1.	Hot plate	1
2.	Soxhlet apparatus	2
3.	Oven	1
4.	Rotary evaporator	1
5.	Electric shaker	1
6.	Simple distillation apparatus	6
7.	Steam distillation apparatus	٦
8.	Water bath (6holes)	1
9.	TLC chamber	2
10.	Magnetic stirrer	2
11.	Microscopes	18
12.	Electric grinder big	2



13.	Porcelain dish	15
14.	U .V lamp	1
15.	Mortar and pestle small in size	5
16.	Micro pipettes	5
17.	Desiccators	1
18.	Buchner funnel (various sizes)	10
19.	Chromatography plates	30
<b>Pharmaceutical Chemistry Lab</b>		
No.	Tool/ equipment name	Quantity
1.	UV/visible Spectrophotometer	1
2.	Hot plate	1
3.	Oven	1
4.	Buchner funnel(various sizes)	5
5.	Water bath (6holes)	1
6.	Autoclave	1
7.	Magnetic stirrer	2
8.	Sonnicator	1
9.	PH meter	1
10.	Colorimeter	1
11.	Mortar and pestle small in size	5
12.	Micro pipettes	5
<b>Anatomy &amp; Histology Lab.</b>		
No.	Tool/ equipment name	Quantity



1.	Histology teaching slides	1 box
2.	Microscopes	20
3.	Microtome	1
4.	Histokintte 2000	1
5.	Microscopes	10
6.	Porcelain dish	14
7.	Teaching slides histology	2
8.	Tissue stains different types	4
9.	Anatomy models : Hip , eye, cardiac, kidney, dental care, skull, skeleton, elbow, male/female urogenital system, joints, muscular system, Brain, nervous system, Alimentary system, bones.	1 of each

### Parasitology & Microbiology Lab.

No.	Tool/ equipment name	Quantity
1.	Bunsen burner	5
2.	Autoclave	1
3.	Microscopes	20
4.	Oven	1
5.	hot plates	2
6.	Incubator	1
7.	Water bath	2
8.	Thermometer	10
9.	pH meter	1
10.	Cupboard Storage	1
11.	Refrigerator	1





12.	Microscope with (slides, cover slips, stains, staining rack, immersion oil)	10
13.	Petri dishes	200
<b>Clinical and Biomedical Lab.</b> <b>( Clinical chemistry, Biochemistry, Pharmacology, Toxicology)</b>		
No.	Tool/ equipment name	Quantity
1.	High performance chromatography (HPLC) with UV detector	1
2.	pH meter	1
3.	Refrigerator	1
4.	Microscopes	20
5.	UV/visible Spectrophotometer	1
6.	Hot plate	3
7.	Water bath	1
8.	UV/visible Spectrophotometer	1
9.	Organ bath with drums	5
10.	ELISA	1
<b>Virtual pharmacy</b>		
Items		
<ul style="list-style-type: none"> <li>Shelves of appropriate size</li> <li>Instructional charts for pharmaceutical calculations</li> <li>Empty out-packages of a lot of pharmaceutical products available in the drug market and comprehend all generic names and variety of dosage forms</li> <li>Table + computer desktop + electronic program of drug indexes + electronic books of drug indexes such as " Clinician drug index"</li> <li>A group of books of drug indexes e.g. MEPP0, MIMS</li> </ul>		
<b>Computer lab</b>		
Items		
<ul style="list-style-type: none"> <li>Computer desktops and appendices : 20 on appropriate table</li> <li>Chairs</li> </ul>		



- Printer : 1
- Scanner : 1
- Microsoft Offices programs and other valuable
- Internet link
- Data show
- White board

#### d. Chemicals & Reagents

A variety types of chemicals and reagents including : acids, alkalis, salts ,solvents , indicators, vehicles , culturing materials and others are required.

1- Sodium hydroxide	24- potassium bromide	48. magnesium sulphate
2- Sodium lauryl sulphate	25- potassium cyanide	49. manganese sulphate
3- Sodium oxalate	26- tripotassium citrate	50. magnesium tri silicate
4- Sodium format	27- potassium hydroxide	51. Ammonium sulphate
5- Sodium chloride	28- Potassium sulphate	52. Ammonium oxalate
6- Sodium borax	29- potassium thiocyanate	53. Ammonium carbonate
7- Sodium nitroprusside	30- Potassium dichromate	54. Ammonium bicarbonate
8- Sodium azide	31- potassium nitrate	55. Ammonium chloride
9- Sodium sulphite	32- potassium chloride	56. Ammonium acetate
10- Sodium nitrate	33- potassium ferricyanide	57. Aluminum sulphate
11- Sodium iodide	34- potassium iodide	58. Aluminum nitrate
12- Sodium sulphate	35- potassium chromate	59. Aluminum chloride
13- Sodium meta bisulphite	27- potassium carbonate	60. nickel sulphate
14- Sodium dodecyl sulphate	36- potassium permanganate	61. cobalt chloride
15- Sodium nitrite	37- potassium ferrocyanide	62. naphthalin
16- Sodium bicarbonate	38- ammonium thiocyanate	63. zinc sulphate
17- Sodium carbonate	39- Ammonium ferric citrate	64. zinc metal( powder)
18- Sodium sulfide	40- Ammonium ferrous sulphate	65. lead chloride
19- Tri Sodium citrate	41- Ammonium tartrate	66. lead powder
20- Sodium acetate	42. calcium hydroxide	67. lead acetate
21- Sodium bromide	43. calcium carbonate	68. mercuric chloride
22- Sodium cobalt nitrite	44. calcium sulphate	69. mercuric sulphate
23- Sodium phosphate	45. calcium acetate	70. mercuric nitrate
	46. calcium chloride	71. ferric sulphate
	47. magnesium carbonate	72. iron 3 chloride
		73. iron 2 sulphate



74. copper 2 acetate	97. alpha naphthol	119. coco nut oil
75. copper 2 sulphate	98. beta naphthol	120. hydroxyl amine hydrochloride
76. barium chloride	99. gum tragacanth	121. di phenyl amine
77. barium sulphate	100. silica gel 254	122. thyme oil
78. barium nitrate	101. sulphur	123. Sudan 3
79. E.D.T.A	102. resorcinol	124. methyl orange
80. zinc oxide	103. talc	125. bromocresol green
81. Ascorbic acid	104. acacia	126. phenol red
82. citric acid	105. bees wax	127. methyl red
83. Benzoic acid	106. calamine	128. silver nitrate
84. Tartaric acid	107. bentonite	129. Fehling's solution A&B
85. Tannic acid	108. cetostearyl alcohol	130. bromine water
86. D. sorbitol	109. kaolin	131. million's reagent
87. stearic acid	110. polyethylene glycol (liquid & solids)	132. methyl violet
88. Boric acid	111. sucrose	133. per chloric acid 70%
89. Acetyl salicylic acid	112. charcoal	134. fluorescein sodium
90. Sulphosalicylic acid	113. iodine	135. urea
91. Salicylic acid	114. lanolin	136. Chloroform
92. Oxalic acid	115. gentian violet	137. Nitric acid
93. chloral hydrate	116. oleic acid	138. N-hexane
94. phenolphthalein	117. tween 80	
95. starch	118. pure code liver oil	
96. gelatin		

### 13. Program Evaluation and Improvement

Evaluation Target	Evaluation period and tool	Samples
Final year students	Annual Questionnaire	50 % of the students number
Program Graduates	Every 2 years Questionnaire	50 % of the graduates number



<p><b>Employment entities</b></p>	<p>Every 3 years (Questionnaire &amp; Meeting)</p>	<ul style="list-style-type: none"> <li>• Supervisors of med. Representatives in a marketing Drug company.</li> <li>• Manager of a local drug factory.</li> <li>• Head pharmacist in a private hospital.</li> <li>• Head pharmacist in a public hospital.</li> <li>• Manager of the Quality control lab. in the supreme board of drugs.</li> </ul>
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## Course Specification of " ARABIC LANGUAGE"

I. Course Identification and General Information:					
1	Course Title:	Arabic Language			
2	Course Code &Number:				
3	Credit hours: 2	C.H			
		Th.	Seminar	Pr	Tr.
		2	-	-	-
4	Study level/ semester at which this course is offered:	First year/First semester			
5	Pre –requisite:				
6	Co –requisite :	-			
7	Program (s) in which the course is offered:	Pharmacy bachelor			
8	Language of teaching the course:	Arabic			
9	Location of teaching the course:	College of medical Science			
10	Prepared By:				
11	Date of Approval	2015			

II. Course Description:
دراسة اللغة العربية من خلال نصوص أدبية وتطبيقات نحوية ، يأخذ أنماط من النصوص الأدبية والشعرية والنثرية من مختلف العصور الأدبية ، ثم استخرج الشواهد النحوية لغرض التطبيق.





<b>(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
Not applicable	-	-
<b>(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
Not applicable	-	-

<b>(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>			
PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
C4	c1. الإلمام بأشهر أبواب النحو التي يستقيم بها اللسان ويعتبر من سلامة القول منطوقاً ومكتوباً.	Lecture Discussion	<ul style="list-style-type: none"> <li>• امتحان</li> <li>• تحريري</li> <li>• تكاليف</li> <li>• أسئلة تقييم</li> </ul>
<b>(D) Alignment Course Intended Learning Outcomes of General and Transferable Skills to Teaching Strategies and Assessment Strategies:</b>			
PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
D3	d1. اكتساب لغة جيدة للتمكن من التواصل مع المرضى موع أفراد الفريق الطبي	Lecture Discussion	<ul style="list-style-type: none"> <li>• تكاليف</li> <li>• أسئلة تقييم</li> </ul>



IV. Course Content:					
Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	مهاره القراءة الجهريه	■ قراءة نصوص نثرية وشعرية ■ تدريبات صفية	3	6	c1, d1
2	مهاره القراءة الصامته	■ قراءة نصوص نثرية وشعرية ■ تدريبات صفية	3	6	c1, d1
	اختبار نصف الفصل		1	2	c1, d1
3	مهاره الكتابة الوظيفية	■ كتابة الرسالة الإدارية ■ تدريبات صفية	4	8	c1, d1
4	الكتابة الوظيفية	■ كتابة التقرير ■ تدريبات صفية	4	8	c1, d1
1١	امتحان نهائي		1	2	c1, d1
Number of Weeks /and Units Per Semester			16	32	

V. Teaching strategies of the course:	
1. Lecture 2. Lecture discussion (Tutorial)	

VI. Assignments:				
No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	<ul style="list-style-type: none"> <li>كتابة التقرير (تكليف جماعي)</li> </ul>	c1, d1	٦-8	٢.5



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Activities	15th week	5	5%	B1,C6
2	Student assignment	5th and 12th week	5	5%	B1,C6
3	Mid-term exam	7th or 8th week	20	20%	B1,C6
4	Final exam	16th-17th week	70	70 %	B1,C6

### Practical part

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
	Not applicable	-	-	-	-

## VIII. Learning Resources:

<b>1- Required Textbook(s)</b>	
	١. تاريخ الأدب العربي / د. أحمد حسن الزيات . ٢. المصادر الأدبية واللغوية في التراث العربي / د. عز الدين إسماعيل.
<b>2- Essential References.</b>	
	١. الأدب العربي الحديث / د. محمد صالح الشطبي.
<b>3- Electronic Materials and Web Sites etc.</b>	
	١. www.google.com ٢. www.yahoo.com

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30



	minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of "ARABIC LANGUAGE I "

I. Information about Faculty Member Responsible for the Course:						
Name of Faculty Member	Office Hours					
Location & Telephone No.	SAT	SUN	MON	TUE	WED	THU
E-mail					X	

II. Course Description:
دراسة اللغة العربية من خلال نصوص أدبية وتطبيقات نحوية ، يأخذ أنماط من النصوص الأدبية والشعرية والنثرية من مختلف العصور الأدبية ، ثم استخراج الشواهد النحوية لغرض التطبيق.

II. COURSE INTENDED LANING OUTCOMES			
(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:			
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies	
Not applicable	-	-	
(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:			
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies	
Not applicable	-	-	
(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:			
PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
C4	c1. الإلمام بأشهر أبواب النحو التي يستقيم بها اللسان ويعتبر من سلامة القول منطوقاً ومكتوباً.	Lecture Discussion	<ul style="list-style-type: none"><li>• امتحان</li><li>• تحريري</li><li>• تكاليف</li><li>• أسئلة تقييم</li></ul>
	(D) Alignment Course Intended Learning Outcomes of		





General and Transferable Skills to Teaching Strategies and Assessment Strategies:			
PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
D3	d1. اكتساب لغة جيدة للتمكن من التواصل مع المرضى موع أفراد الفريق الطبي	Lecture Discussion	<ul style="list-style-type: none"> <li>تكاليف</li> <li>أسئلة تقييم</li> </ul>

IV. Course Content:					
Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	مهارة القراءة الجهرية	<ul style="list-style-type: none"> <li>قراءة نصوص نثرية وشعرية</li> <li>تدريبات صفية</li> </ul>	3	6	c1, d1
2	مهارة القراءة الصامتة	<ul style="list-style-type: none"> <li>قراءة نصوص نثرية وشعرية</li> <li>تدريبات صفية</li> </ul>	3	6	c1, d1
		اختبار نصف الفصل	1	2	c1, d1
3	مهارة الكتابة الوظيفية	<ul style="list-style-type: none"> <li>كتابة الرسالة الإدارية</li> <li>تدريبات صفية</li> </ul>	4	8	c1, d1
4	الكتابة الوظيفية	<ul style="list-style-type: none"> <li>كتابة التقرير</li> <li>تدريبات صفية</li> </ul>	4	8	c1, d1
1١		امتحان نهائي	1	2	c1, d1
Number of Weeks /and Units Per Semester			16	32	



## V. Teaching strategies of the course:

1. Lecture
2. Lecture discussion (Tutorial)

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	كتابة التقرير (تكليف جماعي)	c1, d1	8-12	5

## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Activities	15th week	5	5%	c1, d1
2	Student assignment	5th and 12th week	5	5%	c1, d1
3	Mid-term exam	7th or 8th week	20	20%	c1, d1
4	Final exam	16th-17th week	70	70 %	c1, d1

## VIII. Learning Resources:

1- Required Textbook(s)	
	<p>١. تاريخ الأدب العربي / د. أحمد حسن الزيادات .</p> <p>٢. المصادر الأدبية واللغوية في التراث العربي / د. عز الدين إسماعيل.</p>
2- Essential References.	
	٣. الأدب العربي الحديث / د. محمد صالح الشطبي.
3- Electronic Materials and Web Sites etc.	
	<p>٤. www.google.com</p> <p>٥. www.yahoo.com</p>



## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.



## Course Specification

### **Botany and medicinal plants**

I. Course Identification and General Information:							
1.	Course Title:	Botany and medicinal plants					
2.	Course Code &Number:	YMP 1 122					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-			-
4.	Study level/ semester at which this course is offered:	First year /2 <sup>nd</sup> semester					
5.	Pre –requisite (if any):	Nil					
6.	Co –requisite (if any):	Nil					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	Faculty of medicinal science					
10.	Prepared By:	Prof. Dr Jalal Hamoud Al-qadasi					
11.	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

This course provides a deepening of the subject in areas of plant cell biology and provides a basic knowledge of plant molecular biology and medicinal plants. The course deals with life processes of plants: those include, among others, germination, growth, anatomy and differentiation, metabolism, photosynthesis, stress physiology, flowering, fruiting and plant natural products.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Understand and appreciate the complexity and relationships of plant living systems.
2.	A1	a2. Explain the plant growth and adaptation enabling a plant to handle a variety of habitats.
3.	B1	b1. Develop concepts regarding the factors leading to the great diversity among plants and the need to maintain this diversity.
4.	B2	b2. Aware of changing plant products and their effects and uses in complementary medicin
5.	C1	c1. Perform good laboratory practices in plant biology and sterile in vitro plant culture.
6.	C1	c2. Evaluate the general information on plant physiology and molecular biology.
7.	D1	d1. Skills in scientific research and efficiently use to modern technology in getting information and employee them.
8.	D2	d2. Work in team and be active, cooperative member and able in solving problem and work under stress and have communication skill.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge& understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Understand and appreciate the complexity and relationships of plant living systems.	Lecture Demonstration Practicing Discussion Demonstration Lecture	Theoretical exams Practical Test Assignments Written exam , Attendance
a2. Explain the plant growth and adaptation enabling a plant to handle a variety of habitats.		

##### (b) Alignment Course Intended Learning Outcomes (CILOs) ofIntellectualSkillsto Teaching Strategies and Assessment Strategies:





Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Develop concepts regarding the factors leading to the great diversity among plants and the need to maintain this diversity.	Lecture Demonstration Practicing	Theoretical exams Practical Test Assignments
b2. Aware of changing plant products and their effects and uses in complementary medicin	Discussion Demonstration	
<b>(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Perform good laboratory practices in plant biology and sterile in vitro plant culture.	Lecture Demonstration Practicing (Lab session)	Theoretical exams Practical Test Assignments
c2. Evaluate the general information on plant physiology and molecular biology.	Discussion	
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Skills in scientific research and efficiently use to modern technology in getting information and employee them.	<ul style="list-style-type: none"> <li>Discussion Strategy</li> <li>Case Method</li> <li>Work group Assignments</li> </ul>	<ul style="list-style-type: none"> <li>Use email to deliver assignments.</li> </ul>
d2. Work in team and be active, cooperative member and able in solving problem and work under stress and have communication skill.		Using communication media by students (group working)



<b>V. Course Content:</b>					
<b>A – Theoretical Aspect:</b>					
Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact hours	Learning Outcomes
1	<b>Introduction to Botany and plant cell</b>	1. Concepts to understand plants. 2. Structures and organelles of plant cell	1	2	All ILOs
2	<b>Plant tissues and type of vascular bundles</b>	1. types of plant tissues, and cells 2. types of vascular bundles 3. primary and secondary tissues.	1	2	All ILOs
3	<b>Root morphology and anatomy</b>	1. Roots different morphological features. 2. Root anatomy	2	4	All ILOs
4	<b>Stem morphology and anatomy</b>	1. Morphological characterization of stems 2. Stem anatomy	2	4	All ILOs
5	<b>Leaf morphology and anatomy</b>	1- Morphological characterization of leaves 2- Leaf anatomy	2	4	All ILOs
6	<b>Plant Physiology and Development</b>	1. <i>Photosynthesis</i> . 2. <i>Respiration</i> . 3. Transport Processes. 4. Soil and mineral nutrition.	2	4	All ILOs
7	<b>Flower, Reproduction and Evolution</b>	1. Flower parts 2. Reproduction process 3. Seed germination	1	2	All ILOs
8	<b>Plant Biotechnology</b>	1- Recombinant DNA Technology 2- Plant Biotechnology 3- Genomics	1	2	All ILOs
9	<b>plants Diversity</b>	1. Vascular plants without seeds. 6. Vascular plants with seeds: Non flowering plants	2	4	All ILOs



V. Course Content:					
A – Theoretical Aspect:					
Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact hours	Learning Outcomes
		(Gymnosperms). 7.Vascular plants with seeds: flowering plants (Angiosperms). 8.Ethnobotany			
10	Ethnobotany and Plant Ecology	1.plant and people. 2. Plants Response to the Environment	1	2	All ILOs
Number of Weeks /and Units Per Semester			15	30	

V. Teaching strategies of the course:
<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p> <p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p> <p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p> <p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a summary report on one of the studied medicinal plant	c1, c2	4-13	3



2	<b>Group</b> : each group of students will be assigned to make a letter of education to community about types of plant and medicinal plants	c1, c2, d1, d2,	14	2
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VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, b1, b2, d1,d2
2	Assignments (1 + 2)	4-13, 14	5	5	c1, c2, d1, d2,
3	Quiz 1 + Quiz 2	7, 12	3	3	a1, b1
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, b1, b2, d1,d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, b1, b2, d1,d2
TOTAL			60	60 %	60



VIII. Learning Resources:	
<ul style="list-style-type: none"> <li>Written in the following order: ( Author - Year of publication – Title – Edition – Place of publication – Publisher).</li> </ul>	
Required Textbook(s) (maximum two ).	
	<ul style="list-style-type: none"> <li>Mauseth, James D. (2017). <i>Botany: an introduction to plant biology</i>. (6<sup>th</sup>ed.)Sudbury, Mass: Jones and Bartlett Publishers.</li> <li>Raven, Peter H., Ray Franklin Evert, and Susan E. Eichhorn. (2013). <i>Biology of plants</i>. (8<sup>th</sup>ed.)New York: W.H. Freeman and Co.</li> </ul>
Essential References.	
	<ul style="list-style-type: none"> <li>Stern, K. R., Bidlack, J. E., Jansky, S., &amp; Uno, G. (2017). <i>Introductory plant biology</i>.(14<sup>th</sup>ed.) Boston: McGraw-Hill Higher Education.</li> </ul>
Electronic Materials and Web Sites etc.	
	<ul style="list-style-type: none"> <li><a href="https://www.mheducation.com/highered/contact.html">https://www.mheducation.com/highered/contact.html</a></li> </ul>

IX.Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecturewill not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the examwill not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course





6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.
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## **Course Plan (Syllabus) of botany and medicinal plant**

### **I. - Information about Faculty Member Responsible for the Course:**

Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

### **I. Course Description:**

This course provides a deepening of the subject in areas of plant cell biology and provides a basic knowledge of plant molecular biology and medicinal plants. The course deals with life processes of plants: those include, among others, germination, growth, anatomy and differentiation, metabolism, photosynthesis, stress physiology, flowering, fruiting and plant natural products.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 3. Alignment CILOs to PILOs

No.	PILOs	CILOs
9.	A3	a1. Understand and appreciate the complexity and relationships of plant living systems.
10.	A1	a2. Explain the plant growth and adaptation enabling a plant to handle a variety of habitats.
11.	B1	b1. Develop concepts regarding the factors leading to the great diversity among plants and the need to maintain this diversity.
12.	B2	b2. Aware of changing plant products and their effects and uses in complementary medicin
13.	C1	c1. Perform good laboratory practices in plant biology and sterile in vitro plant culture.
14.	C1	c2. Evaluate the general information on plant physiology and molecular biology.
15.	D1	d1. Skills in scientific research and efficiently use to modern technology in getting information and employee them.
16.	D2	d2. Work in team and be active, cooperative member and able in solving problem and work under stress and have communication skill.

#### 4. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge& understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Understand and appreciate the complexity and relationships of plant living systems.	Lecture Demonstration Practicing Discussion Demonstration Lecture	Theoretical exams Practical Test Assignments Written exam , Attendance
a2. Explain the plant growth and adaptation enabling a plant to handle a variety of habitats.		

##### (b) Alignment Course Intended Learning Outcomes (CILOs) ofIntellectualSkillsto Teaching Strategies and Assessment Strategies:



Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Develop concepts regarding the factors leading to the great diversity among plants and the need to maintain this diversity.	Lecture Demonstration Practicing	Theoretical exams Practical Test Assignments
b2. Aware of changing plant products and their effects and uses in complementary medicin	Discussion Demonstration	
<b>(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Perform good laboratory practices in plant biology and sterile in vitro plant culture.	Lecture Demonstration Practicing (Lab session)	Theoretical exams Practical Test Assignments
c2. Evaluate the general information on plant physiology and molecular biology.	Discussion	
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Skills in scientific research and efficiently use to modern technology in getting information and employee them.	<ul style="list-style-type: none"> <li>Discussion Strategy</li> <li>Case Method</li> <li>Work group Assignments</li> </ul>	<ul style="list-style-type: none"> <li>Use email to deliver assignments.</li> </ul>
d2. Work in team and be active, cooperative member and able in solving problem and work under stress and have communication skill.		Using communication media by students (group working)



<b>V. Course Content:</b>					
<b>A – Theoretical Aspect:</b>					
Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact hours	Learning Outcomes
1	<b>Introduction to Botany and plant cell</b>	1. Concepts to understand plants. 2. Structures and organelles of plant cell	1	2	All ILOs
2	<b>Plant tissues and type of vascular bundles</b>	1. types of plant tissues, and cells 2. types of vascular bundles 3. primary and secondary tissues.	1	2	All ILOs
3	<b>Root morphology and anatomy</b>	3. Roots different morphological features. 4. Root anatomy	2	4	All ILOs
4	<b>Stem morphology and anatomy</b>	3. Morphological characterization of stems 4. Stem anatomy	2	4	All ILOs
5	<b>Leaf morphology and anatomy</b>	3- Morphological characterization of leaves 4- Leaf anatomy	2	4	All ILOs
6	<b>Plant Physiology and Development</b>	1. <i>Photosynthesis</i> . 2. <i>Respiration</i> . 3. Transport Processes. 4. Soil and mineral nutrition.	2	4	All ILOs
7	<b>Flower, Reproduction and Evolution</b>	4. Flower parts 5. Reproduction process 6. Seed germination	1	2	All ILOs
8	<b>Plant Biotechnology</b>	4- Recombinant DNA Technology 5- Plant Biotechnology 6- Genomics	1	2	All ILOs
9	<b>plants Diversity</b>	1. Vascular plants without seeds. 6. Vascular plants with seeds: Non flowering plants	2	4	All ILOs





V. Course Content:					
A – Theoretical Aspect:					
Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact hours	Learning Outcomes
		(Gymnosperms). 7.Vascular plants with seeds: flowering plants (Angiosperms). 8.Ethnobotany			
10	Ethnobotany and Plant Ecology	1.plant and people. 2. Plants Response to the Environment	1	2	All ILOs
Number of Weeks /and Units Per Semester			15	30	

V. Teaching strategies of the course:
<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>



## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to do a summary report on one of the studied medicinal plant	c1, c2	4-13	3
2	<b>Group :</b> each group of students will be assigned to make a letter of education to community about types of plant and medicinal plants	c1, c2, d1, d2,	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, b1, b2, d1,d2
2	Assignments (1 + 2)	4-13, 14	5	5	c1, c2, d1, d2,
3	Quiz 1 + Quiz 2	7, 12	3	3	a1, b1
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, b1, b2, d1,d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, b1, b2, d1,d2
TOTAL			60	60 %	60



VIII. Learning Resources:	
<ul style="list-style-type: none"> <li>Written in the following order: ( Author - Year of publication – Title – Edition – Place of publication – Publisher).</li> </ul>	
Required Textbook(s) (maximum two ).	
	<ul style="list-style-type: none"> <li>Mauseth, James D. (2017). <i>Botany: an introduction to plant biology</i>. (6<sup>th</sup> ed.) Sudbury, Mass: Jones and Bartlett Publishers.</li> <li>Raven, Peter H., Ray Franklin Evert, and Susan E. Eichhorn. (2013). <i>Biology of plants</i>. (8<sup>th</sup> ed.) New York: W.H. Freeman and Co.</li> </ul>
Essential References.	
	<ul style="list-style-type: none"> <li>Stern, K. R., Bidlack, J. E., Jansky, S., &amp; Uno, G. (2017). <i>Introductory plant biology</i>. (14<sup>th</sup> ed.) Boston: McGraw-Hill Higher Education.</li> </ul>
Electronic Materials and Web Sites etc.	
	<ul style="list-style-type: none"> <li><a href="https://www.mheducation.com/highered/contact.html">https://www.mheducation.com/highered/contact.html</a></li> </ul>

IX. Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work



5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.





## ENGLISH LANGUAGE I

I. Course Identification and General Information:							
1.	Course Title:	ENGLISH LANGUAGE I					
2.	Course Code &Number:						
3.	Credit hours:	C.H					TOTAL
		L.	Tu.	S.	P	Tr.	
		2	-	-	-	-	2
4.	Study level/ semester at which this course is offered:	First Year – 1 <sup>ST</sup> semester					
5.	Pre –requisite (if any):	none					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	2019					

## II. Course Description:

This course provides the student with basic structure and grammars in English language.





### III. Program Intended learning outcomes (PILOs) & the Course Intended learning outcomes (CILOs) and their alignment to teaching and assessment strategies

#### A) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

PILOs	CILOs	Teaching strategies	Assessment Strategies
<b>A3</b>	<b>a1-</b> comprehend the basic grammars and rule of basic English	<b>lecture, Tutorial</b>	<b>written exam , assignments, quizzes</b>

#### (B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

PILOs	CILOs	Teaching strategies	Assessment Strategies
<b>B2</b>	<b>b1-</b> Differentiate between various English words & phrases	<b>lecture, Tutorial</b>	<b>written exam , assignments, quizzes</b>

#### (C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

<b>C4</b>	<b>c1-</b> Effectively & correctly use language grammars & fundamental skills (reading, writing and speech) to present thoughts/ideas.	<b>lecture, Tutorial</b>	<b>written exam , assignments, quizzes</b>
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#### (D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>D4</b>	<b>d1-</b> demonstrate self-learning and time management skills.	<b>lecture, Tutorial</b>	<b>assignments</b>



#### IV. Course Content:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Basic English	b1, c1, d1	<ul style="list-style-type: none"> <li>English letters : A to Z, capitals, small letters</li> <li>Classification of words <ul style="list-style-type: none"> <li>Nouns</li> <li>Articles</li> <li>Pronouns</li> <li>Quantity</li> <li>Adjective</li> <li>Adverbs</li> <li>Prepositions</li> </ul> </li> <li>verbs : Be, have, do , Modal auxiliaries and related verbs</li> </ul>	6	12
	MID-SEMESTER EXAM			1	2
2	The sentence	b1, c1, d1	<ul style="list-style-type: none"> <li>Simple, compound, complex</li> <li>Passive and causative</li> <li>Questions, answers</li> <li>Conditional sentences</li> <li>Direct and indirect speech</li> <li>The infinitive and the "ing" form</li> </ul>	7	16
	Courser review			1	2
	Final exams			1	2
			Total	16	32
Number of Weeks /and Units Per Semester				16	2

#### V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector



## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Tutorial exercises	b1, c1, d1	3	2
2	Homework Exercises	b1, c1, d1	7	1

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5 %	b1, c1, d1
2	Assignments	4, 14	10	10 %	b1, c1, d1
3	Quizzes	7, 12	5	5 %	b1, c1, d1
4	Mid-semester exam	7	20	20 %	b1, c1, d1
5	Final exam	17	60	60 %	b1, c1, d1
TOTAL			100	100 %	

## VII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

L.G. Alexander, 2007, Longman English grammar practice, , Longman Group, UK

### 2- Essential References.

Mary Lou, 2011, The English Teacher's Survival Guide: Ready-To-Use Techniques & Materials for Grades 7-12 , 2nd Edition, Jossey-Bass teachers, USA

### 3- Electronic Materials and Web Sites etc.

[www.ego4u.com/](http://www.ego4u.com/)



## VIII. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
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5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of ENGLISH LANGUAGE

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>This course provides the student with basic structure and grammars in English language.</p>





### III. Program Intended learning outcomes (PILOs) & the Course Intended learning outcomes (CILOs) and their alignment to teaching and assessment strategies

<b>A) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>			
PILOs	CILOs	Teaching strategies	Assessment Strategies
<b>A3</b>	<b>a1-</b> comprehend the basic grammars and rule of basic English	<b>lecture, Tutorial</b>	<b>written exam , assignments, quizzes</b>
<b>(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>			
PILOs	CILOs	Teaching strategies	Assessment Strategies
<b>B2</b>	<b>b1-</b> Differentiate between various English words & phrases	<b>lecture, Tutorial</b>	<b>written exam , assignments, quizzes</b>
<b>(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>			
<b>C4</b>	<b>c1-</b> Effectively & correctly use language grammars & fundamental skills (reading, writing and speech) to present thoughts/ideas.	<b>lecture, Tutorial</b>	<b>written exam , assignments, quizzes</b>
<b>(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>D4</b>	<b>d1-</b> demonstrate self-learning and time management skills.	<b>lecture, Tutorial</b>	<b>assignments</b>



IV. Course Content:					
Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Basic English	b1, c1, d1	<ul style="list-style-type: none"> <li>English letters : A to Z, capitals, small letters</li> <li>Classification of words <ul style="list-style-type: none"> <li>Nouns</li> <li>Articles</li> <li>Pronouns</li> <li>Quantity</li> <li>Adjective</li> <li>Adverbs</li> <li>Prepositions</li> </ul> </li> <li>verbs : Be, have, do , Modal auxiliaries and related verbs</li> </ul>	6	12
	MID-SEMESTER EXAM			1	2
2	The sentence	b1, c1, d1	<ul style="list-style-type: none"> <li>Simple, compound, complex</li> <li>Passive and causative</li> <li>Questions, answers</li> <li>Conditional sentences</li> <li>Direct and indirect speech</li> <li>The infinitive and the "ing" form</li> </ul>	7	16
	Courser review			1	2
	Final exams			1	2
			Total	16	32
Number of Weeks /and Units Per Semester				16	2



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Tutorial exercises	b1, c1, d1	3	2
2	Homework Exercises	b1, c1, d1	7	1

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5 %	b1, c1, d1
2	Assignments	4, 14	10	10 %	b1, c1, d1
3	Quizzes	7, 12	5	5 %	b1, c1, d1
4	Mid-semester exam	7	20	20 %	b1, c1, d1
5	Final exam	17	60	60 %	b1, c1, d1
TOTAL			100	100 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

L.G. Alexander, 2007, Longman English grammar practice, , Longman Group, UK

### 2- Essential References.

Mary Lou, 2011, The English Teacher's Survival Guide: Ready-To-Use Techniques & Materials for Grades 7-12 , 2nd Edition, Jossey-Bass teachers, USA

### 3- Electronic Materials and Web Sites etc.

[www.ego4u.com/](http://www.ego4u.com/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
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5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## ENGLISH LANGUAGE II : توصيف المقرر

I. معلومات عامة عن المقرر :General information about the course				
ENGLISH LANGUAGE II				
1. اسم المقرر :Course Title				
2. رمز المقرر ورقمه :Course Code and Number				
3. الساعات المعتمدة :Credit Hours 3				
الإجمالي Total	تدريب Training	عملي Practical	سمنار/تمارين Seminar/ Tutorial	محاضرة Lecture
٢	-	-	-	٢
4. المستوى والفصل الدراسي : Study Level and Semester				
First Year – Second Semester				
5. المتطلبات السابقة لدراسة المقرر (إن وجدت) :requisites (if any)				
ENGLISH LANGUAGE II				
6. المتطلبات المصاحبة (إن وجدت) :Co-requisites (if any)				
None				
7. البرنامج الذي يدرس له المقرر :the course is offered				
Bachelor in Administration				
8. لغة تدريس المقرر :Teaching Language				
English and Arabic				
9. نظام الدراسة :Study System				
Regular				
10. معد (و) توصيف المقرر : Prepared by				
Yemen University - main campus				
11. المكان الذي يدرس فيه المقرر				
2015				
12. تاريخ اعتماد توصيف				
13. الجهة التي اعتمدت التوصيف : Approved by				





## II. وصف المقرر :Course Description

This course provides students with the knowledge and basic skills in learning English as a foreign language in order to develop their English language abilities and competencies that are required to cope with the various communicative needs in their academic studies as well as in their careers later.

## III. أهداف المقرر :Course Aims

The course aims at enabling students to:

1. Read and understand the general ideas of a variety of texts. (READING)
2. Understand the main points of a range of familiar matters given in clear and relatively slow speech. (LISTENING COMPREHENSION)
3. Express personal opinions and exchange information on familiar topics. (SPEAKING)
4. Produce short connected texts divided into paragraphs on familiar topics and appropriate vocabulary. (WRITING)
5. Demonstrate control of a limited range of vocabulary and grammatical structures with minor inconsistencies. (USE OF ENGLISH)

## مخرجات التعلم المقصودة للمقرر ( ILCOs ) وربطها بمخرجات التعلم المقصودة للبرنامج ( PILOs ):

PILOs	ILCOs	م
A1	1. Recognize the basic skills that are related to reading in English as a foreign language. (READING)	a1
A1	2. Know and understand the basic skills of listening to the common topics in English as a foreign language. (LISTENING COMPREHENSION)	a2
A2		a3
A1		a4
B2	3. Identify the basic skills in how to express personal opinions and exchange information on familiar topics in English as a foreign language. (SPEAKING)	b1
B2	4. Know and understand the concepts, principles and theories in how to produce short connected texts divided into paragraphs on familiar topics and appropriate vocabulary. (WRITING)	b2
B2		b3
B1		b4
C1	1. Read and understand the general ideas of so many texts related to his/her specialization. (READING)	c1
C2	2. Understand the main points on a range of familiar matters given in clear and relatively slow speech. (LISTENING COMPREHENSION)	c2



C2		c3
D2	3. Express personal opinions and exchange information on familiar topics. (SPEAKING)	d1
D1	4. Produce short connected texts divided into paragraphs on familiar topics and appropriate vocabulary. (WRITING)	d2
D1		d3
D2		d4

١- مخرجات التعلم المقصودة للمقرر (ILCOs) : Intended Learning Outcomes of Course		
المعرفة والفهم : Knowledge and Understanding		
<p>يتم ربط مخرجات البرنامج بمخرجات المقرر</p> <p>Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)</p>		
مخرجات المقرر (معرفة وفهم) Knowledge and Understanding CILOs	مخرجات البرنامج (معرفة وفهم) Knowledge and Understanding PILOs	
بعد الانتهاء من هذا المقرر سيكون الطالب قادراً على أن: After completing this course, students would be able to:	بعد الانتهاء من هذا البرنامج سيكون الطالب قادراً على أن After completing this program, students would be able to:	
a1. Recognize the basic skills that are related to reading in English as a foreign language. (READING)	يوضح المفاهيم والمبادئ والسياسات والإجراءات المتعلقة بالنظريات الإدارية والمحاسبية والاقتصادية والمعلوماتية التي تطبق في إدارة المستشفيات والمؤسسات الصحية.	A1
a2. Know and understand the basic skills of listening to the common topics in English as a foreign language. (LISTENING COMPREHENSION)	يعرف الوظائف التنظيمية في إدارة المستشفيات والمؤسسات الصحية والإجراءات والممارسات التنفيذية لها.	A2

المهارات الذهنية : Intellectual Skills	
<p>يتم ربط مخرجات البرنامج بمخرجات المقرر</p> <p>Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)</p>	
مخرجات المقرر (مهارات ذهنية)	مخرجات البرنامج (مهارات ذهنية)



Intellectual Skills CILOs	Intellectual Skills PILOs
بعد الانتهاء من هذا المقرر سيكون الطالب قادراً على أن : After completing this course, students would be able to:	بعد الانتهاء من هذا البرنامج سيكون الطالب قادراً على أن: After completing this program, students would be able to:
b1. Identify the basic skills in how to express personal opinions and exchange information on familiar topics in English as a foreign language. (SPEAKING)	B1 يحلل المشكلات الإدارية والتنظيمية والصحية في المؤسسات الصحية تحليلاً علمياً للوصول إلى اختيار الحل الأنسب لها.
b2. Know and understand the concepts, principles and theories in how to produce short connected texts divided into paragraphs on familiar topics and appropriate vocabulary. (WRITING)	B 2 يستقرئ ويستنبط تأثيرات البيئة الداخلية والخارجية على المؤسسات الصحية وجودة خدماتها الصحية.

المهارات العملية والمهنية Professional and Practical Skills	
يتم ربط مخرجات البرنامج بمخرجات المقرر Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
مخرجات المقرر (مهارات عملية ومهنية) Professional and Practical Skills CILOs	مخرجات البرنامج (مهارات عملية ومهنية) Professional and Practical Skills PILOs
بعد الانتهاء من هذا المقرر سيكون الطالب قادراً على أن: After completing this course, students would be able to:	بعد الانتهاء من هذا البرنامج سيكون الطالب قادراً على أن: After completing this program, students would be able to:
c1. Read and understand the general ideas of so many texts related to his/her specialization. (READING)	C1 يطبق مبادئ وأسس ومعايير الجودة وإدارة التميز والريادة في إدارة المؤسسات الصحية.
c2. Understand the main points on a range of familiar matters given in clear and relatively slow speech. (LISTENING COMPREHENSION)	C2 يضخ خطة استراتيجية قابلة للتنفيذ لإدارة المستشفيات بكفاءة وفاعلية.

المهارات الانتقالية (العامة) Transferable (General) Skills
يتم ربط مخرجات البرنامج بمخرجات المقرر



Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)		
مخرجات المقرر (مهارات انتقالية (عامة)) Transferable (General) Skills CILOs	مخرجات البرنامج (مهارات انتقالية (عامة)) Transferable (General) Skills PILOs	
بعد الانتهاء من هذا المقرر سيكون الطالب قادراً على أن: After completing this course, students would be able to:	بعد الانتهاء من هذا البرنامج سيكون الطالب قادراً على أن After completing this program, students would be able to:	
d1. Express personal opinions and exchange information on familiar topics. (SPEAKING)	D1	يشارك الآخرين في تحقيق أهداف المؤسسة الصحية من خلال الإدارة بالمشاركة لفريق العمل.
d2. Produce short connected texts divided into paragraphs on familiar topics and appropriate vocabulary. (WRITING)	D2	يحسن باستمرار من قدراته ومهارته المعرفية والعلمية في إدارة المؤسسات الصحية.

٢- ربط مخرجات التعلم باستراتيجيات التدريس والتقييم Alignment of CILOs to Teaching and Assessment Strategies		
أولاً: ربط مخرجات تعلم المقرر/المعرفة والفهم باستراتيجية التدريس والتقييم: First: Alignment of Knowledge and Understanding CILOs		
استراتيجية التقييم Assessment Strategies	استراتيجية التدريس Teaching Strategies	مخرجات التعلم المقصودة للمقرر Knowledge and Understanding ILCOs
<ul style="list-style-type: none"> <li>Assignments,</li> <li>Quiz,</li> <li>Exercise,</li> <li>Question,</li> <li>Viva-voce,</li> <li>Mid-term exam,</li> <li>Final Exam.</li> </ul>	<ul style="list-style-type: none"> <li>Cooperative learning groups,</li> <li>Lectures,</li> <li>Pair work,</li> <li>Brainstorming,</li> <li>Discussion.</li> </ul>	a1. Recognize the basic skills that are related to reading in English as a foreign language. (READING) a2. Know and understand the basic skills of listening to the common topics in English as a foreign language. (LISTENING COMPREHENSION)

ثانياً: ربط مخرجات تعلم المقرر/المهارات الذهنية باستراتيجية التدريس والتقييم: Second: Alignment of Intellectual Skills CILOs
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استراتيجية التقييم Assessment Strategies	استراتيجية التدريس Teaching Strategies	مخرجات المقرر / المهارات الذهنية Intellectual Skills CILOs
<ul style="list-style-type: none"> <li>• Assignments,</li> <li>• Quiz,</li> <li>• Exercise,</li> <li>• Question,</li> <li>• Viva-voce,</li> <li>• Mid-term exam,</li> <li>• Final Exam.</li> </ul>	<ul style="list-style-type: none"> <li>• Cooperative learning groups,</li> <li>• Lectures,</li> <li>• Pair work,</li> <li>• Brainstorming,</li> <li>• Discussion.</li> </ul>	<p>b1. Identify the basic skills in how to express personal opinions and exchange information on familiar topics in English as a foreign language. (SPEAKING)</p> <p>b2. Know and understand the concepts, principles and theories in how to produce short connected texts divided into paragraphs on familiar topics and appropriate vocabulary. (WRITING)</p>

ثالثا: ربط مخرجات تعلم المقرر/المهارات المهنية والعملية باستراتيجية التدريس والتقييم: Third: Alignment of Professional and Practical Skills CILOs		
استراتيجية التقييم Assessment Strategies	استراتيجية التدريس Teaching Strategies	مخرجات المقرر / المهارات المهنية والعملية Professional and Practical Skills CILOs
<ul style="list-style-type: none"> <li>• Assignments,</li> <li>• Quiz,</li> <li>• Exercise,</li> <li>• Question,</li> <li>• Viva-voce,</li> <li>• Mid-term exam,</li> <li>• Final Exam.</li> </ul>	<ul style="list-style-type: none"> <li>• Cooperative learning groups,</li> <li>• Lectures,</li> <li>• Pair work,</li> <li>• Brainstorming,</li> <li>• Discussion.</li> </ul>	<p>c1. Read and understand the general ideas of so many texts related to his/her specialization. (READING)</p> <p>c2. Understand the main points on a range of familiar matters given in clear and relatively slow speech. (LISTENING COMPREHENSION)</p>

رابعا: ربط مخرجات تعلم المقرر/المهارات الانتقالية (العامة) باستراتيجية التدريس والتقييم: Fourth: Alignment of Transferable (General) Skills CILOs		
استراتيجية التقييم Assessment Strategies	استراتيجية التدريس Teaching Strategies	مخرجات المقرر / المهارات الانتقالية (العامة) Transferable (General) Skills CILOs





<ul style="list-style-type: none"> <li>• Assignments,</li> <li>• Quiz,</li> <li>• Exercise,</li> <li>• Question,</li> <li>• Viva-voce,</li> <li>• Mid-term exam,</li> <li>• Final Exam.</li> </ul>	<ul style="list-style-type: none"> <li>• Cooperative learning groups,</li> <li>• Lectures,</li> <li>• Pair work,</li> <li>• Brainstorming,</li> <li>• Discussion.</li> </ul>	<p>d1. Express personal opinions and exchange information on familiar topics. (SPEAKING)</p> <p>d2. Produce short connected texts divided into paragraphs on familiar topics and appropriate vocabulary. (WRITING)</p>
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٣- كتابة مواضيع المقرر الرئيسة والفرعية (النظرية والعملية) وربطها بمخرجات التعلم المقصودة للمقرر مع تحديد الساعات الفعلية لها. Course topics and sub-topics (theoretical and practical) with contact hours and alignment to CILOs					
كتابة وحدات /مواضيع محتوى المقرر Topics/Units of Course Contents					
أولاً: الجانب النظري First: Theoretical Aspects					
الرقم No.	وحدات / موضوعات المقرر Course Topics/Units	المواضيع التفصيلية Sub-topics	عدد الأسابيع No. of Weeks	الساعات الفعلية Contact Hours	مخرجات تعلم المقرر CILOs
1	Unit 7 Do's and don'ts	- Have (got) to, - Should, - Must.	1	2	a1, b2, c1, d2, d2
2	Unit 7 Do's and don'ts	- Time and conditional clauses, - What if ...?	2	2	a1, a2, b1, b2, c2, d1
3	Unit 8 Scared to death	- Verb patterns 2, - Infinitives, - Purpose.	3	2	a1, a2, b1, b2, c1, c2, d1
4	Unit 8 Scared to death	- Passives and active	4	2	a1, b2, c1, c2, d1
5	Unit 9	- Second conditional, - Might.	٥	2	a1, a2, b1, b2, c2,



d1, d2				Things that changed the world	
a1, b1, b2, c2, d1, d2	2	٦	- Present perfect continuous, - Present perfect simple versus continuous.	Unit 9 Things that changed the world	6
a1, a2, b1, b2, c1, c2, d1	2	٧	- Past perfect for clarification, - Reported statements.	Unit 10 Dreams and reality	7
a1, a2, b1, b2, c2, d1, d2	2	٨	- Jobs, - Travelling abroad, - Words that go together.	Unit 10 Dreams and reality	8
a1, a2, b1, b2, c1, c2, d1	2	٩	- Hot verbs, - Hotels.	Unit 11 Earning a living	9
a1, a2, b1, b2, c2, d1, d2	2	١٠	- Shops, - Describing feelings and situations.	Unit 11 Earning a living	10
a1, a2, b1, b2, c1, c2, d1	2	١١	- Verbs and past participles, - Verbs and nouns that go together.	Unit 12 Family ties	11
a1, a2, b1, b2, c2, d1, d2	2	١٢	- Jobs and alphabet game - Word formation - Adverbs	Unit 12 Family ties	12
	24	12	Total number of weeks and hours إجمالي عدد الأسابيع والساعات		

I. استراتيجيات التدريس Teaching Strategies	
• Cooperative learning groups,	
• Lectures,	
• Pair work,	
• Brainstorming,	



• Discussion,
• Self-study.

II. الأنشطة Tasks and Assignments:				
الرقم No.	النشاط / التكليف Task/Assignment	مخرجات التعلم CILOs	الأسبوع Week due	الدرجة Mark
1	• Assignments, • Quiz,	a1, a2, b1, b2, c1, c2, d1, d2	2-6	10
2	• Questions, • Viva-voce,	a1, a2, b1, b2, c1, c2, d1, d2	7-11	10

I. تقييم التعلم:					
الرقم	موضوعات التقييم	الأسبوع	الدرجة	الوزن النسبي (نسبة الدرجة إلى درجة التقييم النهائي)	المخرجات التي يحققها
١.	الواجبات / الأنشطة / التكليف Homework/Tasks/Assignments	2-11	10	% 10	a1, a2, b1, b2, c1, c2, d1, d2
٢.	Assignments, Quizzes, Viva-voce, Question, Discussion and Participation.	2-11	10	% 10	a1, a2, b1, b2, c1, c2, d1, d2
٣.	Mid-term exam	٧	20	% 20	a1, a2, b1, b2, c1, c2, d1, d2
٥	Final exam	١٣	60	% 60	a1, a2, b1, b2, c1, c2, d1, d2
	المجموع		100	%100	



III. مصادر التعلم Learning Resources:
(اسم المؤلف، سنة النشر (بين قوسين)، اسم الكتاب، الطبعة، دار النشر، بلد النشر). (Author, (Year), Book Title, Edition, Publisher, Country of publishing)
المراجع الرئيسة: (لا تزيد عن مرجعين) Textbooks-not more than 2
<b>John and Liz Soars, (2006) New Headway Plus, Pre-Intermediate Student's book, Oxford University Press. (Part two Unit 7- 12)</b>
المراجع المساعدة: (لا تقل عن أربعة) Essential References-not less than 4
<b>1. Interactions 1, Grammar (Middle East edition) by Kerin, Jack, and O'Sullivan.</b>
<b>2. Modern English Exercises for Non-Native Speakers: Part 1, Parts of Speech and Part 2, Sentences and Complex Structures. Frank, Marcella.</b>

I. الضوابط والسياسات المتبعة في المقرر (تحدد مركزياً من قبل عمادة الكلية)	
Class الحضور والغياب:  Attendance:  Student should attend at least 75% of the total contact hours of the subject; otherwise he/she will not be allowed to sit for the course exam and will be considered as exam failure.  If the student's absence repeated due to illness, he/she will be demanded to provide a definite proof from the university Clinic.  If the student's absence rate is above 25% of the course total contact hours without a reasonable excuse, he/she will be notified to study the entire course again.	1.
Tardiness: الحضور المتأخر:  Coming late to the class, the student will be initially noticed. In case he/she repeats coming after proper time, the lecturer has the right to consider him/her absent without any warning before hand.	2.
Exam ضوابط الاختبارات والامتحانات:  Attendance/Punctuality:  - Student should attend the exam in time. He/she is Permitted to attend the exam half an hour late from the exam beginning, after that he/she will not be permitted to sit for the exam and be considered as absent in the exam. If he/she is absent from the exam without any acceptable excuse, he/she will get zero mark. Students who could not attend the exam due to adequate reason (illness, other reasons), will be granted another chance in the Re-exam period and this chance will be considered as his/her first chance.  - The student is passed the exam by achieving overall marks of 50% and or above. If the mark obtained	3.



<p>in a course is less than 50% then the student will be considered fail and he/she will be granted a second chance (Re-Exam). The course overall mark after successful re-exam will be capped at 50%.</p> <ul style="list-style-type: none"> <li>- Student who does not pass the re-exam will be given another chance of re-exam, again and again until he/she passes the course, except in the final year if he/she does not pass the course, he/she will be notified to study the entire course again.</li> <li>- Student who does not achieve 50% or more, he/she will be obliged to study the course.</li> </ul>	
<p><b>Assignments &amp; Projects:</b></p> <p>In general, one assignment is given after each chapter of a course. The student should submit the assignment on time, mostly one week after the assignment is given.</p> <p>The weight of the assignments in the general marks will be considered 5% for a course without practical and 7% for a course have practical aspects.</p>	<p><b>المهام / التكليف / التعينات:</b></p> <p>.4</p>
<p><b>Plagiarism:</b></p> <p>Any student caught cheating or copying home work will be punished according the code of conduct and policies used in the faculty according the university regulations.</p>	<p><b>الغش:</b></p> <p><b>Cheating:</b></p> <p>.5</p>
<p><b>Plagiarism:</b></p> <p>Plagiarism and cheating are serious offenses and may be punished by grade (fail) in exam, paper or project.</p>	<p><b>الانتحال:</b></p> <p>.6</p>
<p><b>Other</b></p> <ul style="list-style-type: none"> <li>- The mobile is not allowable to be used during the lecture. It must be turned off, otherwise the student will be asked to leave the lecture room.</li> <li>- The mobile is not allowed to be taken to the exam hall.</li> <li>- Lecture notes and assignments may be given directly to students using soft or hard copy.</li> <li>- Students should familiarize themselves with all University and College Policies that cover students' rights, responsibilities and the Academic Appeal process.</li> </ul>	<p><b>سياسات أخرى:</b></p> <p><b>policies:</b></p> <p>.7</p>





## Course Specification

### GENERAL CHEMISTRY

I. Course Identification and General Information:							
1.	Course Title:	General chemistry					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( FIRST ) Year – (1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	NONE					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course concerns with study of basic concepts of chemistry as an introduction to specific pharmaceutical and medicinal chemistry courses.



### III. Intended learning outcomes of the course: (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No	PILOs	Intended learning outcomes of the course (CILOs)
1.	A2	a1. Explain the roles of chemistry in modern sciences .
2.		a2. Explicit the chemical structures of matters and their chemical properties
3.	A3	a3. Discuss the principles and types of chemical reactions
4.	B1	b1. Interpret the type of chemical bond that form between atoms
5.	B2	b2 .Solve chemical problems related to chemical formula, electronic configuration , quantum (molecular weight, molarity, normality), pH, ionization constant and pKa
6.		b3. Classify types of electronic configuration, categories of elements based on periodical table, types of chemical compounds based on certain chemical properties such as acidity/basicity
7.		b4. Compare between the different types of chemistry disciplines and also between inorganic and organic compounds.
8.	B3	b5 .Express the chemical compounds and elements using abbreviate letters.
9.		b6. Relate the atom reactivity to electronic configuration to.
10.		b7. Predict the outcomes of a chemical reaction between two chemical entities.
11.	C1.	c1.Handle efficiently the tools and chemicals used in chemistry lab.
12.		c2. Operate successfully pH-meter and other instruments used in chemistry lab.
13.	C2	c3 .Perform effectively chemical experimentations including chemical reactions and identification in chemistry lab using standard procedures and provide report of his work.
14.	C3	c4 .Take the required safety criteria during performing experiments in chemistry lab.
15.	D1	d1. Work successfully in team-work during performing experiments in chemistry lab.
16.	D2	d2. Behave in discipline during performing experiments in chemistry lab.
17.	D3	D3. Communicate effectively with colleagues.
18.	D4	d4. Demonstrate the ability of time management, self-learning and problem-solving skills.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	written exam
a3	Lecture	written exam

### (b) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lectures	Written exam
b2, b3 , b4	Lecture, feed-back learning	written exam , assignment, quizzes
b5, b6 , b7	Lecture, feed-back learning	written exam, quizzes

### (c) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments, lab. reporting, practical exam )
c3	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
C4	Lab. Practice	Practical assessment (Lab accomplishment + practical exam )

### (d) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice	Practical assessment (Attitude)
d2	Lab. Practice,	Practical assessment (Lab Attitude)



d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	Aligned Course Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, b4	<ul style="list-style-type: none"> <li>chemistry (definition, brief history)</li> <li>disciplines of chemistry : general, organic, inorganic, analytical, medicinal, physical, etc.)</li> <li>importance and applications of chemistry in modern sciences.</li> </ul>	1	2
2	<b>Chemical structures</b>	a2, b1, b2, b3, b6	<ul style="list-style-type: none"> <li>atoms , atomic structure</li> <li>electronic configuration</li> <li>molecules and molecular formula,</li> <li>elements, periodic table of elements,</li> <li>compounds (types)</li> <li>chemical bonds (ionic, covalent, etc)</li> </ul>	3	6
3	<b>Chemical properties</b>	a2, b2	<ul style="list-style-type: none"> <li>electronegativity, dipole moments, polar and non-polar molecules</li> <li>acidity, basicity. (pH), ionization constant , pKa</li> <li>buffer systems</li> </ul>	2	4
MID-TERM EXAM				1	2
4	<b>Quantum in chemistry</b>	b2	<ul style="list-style-type: none"> <li>atomic weight, molecular weight, equivalent weight, milliequivalent, moles</li> <li>molarity, molality, normality</li> </ul>	2	4
5	<b>Chemical reactions and equilibrium</b>	a3, b7, c2	<ul style="list-style-type: none"> <li>chemical reactivity, inertness, energy change and heat of reaction</li> <li>chemical equations balance</li> <li>reactions catalysts</li> <li>acid-base reactions, Redox reactions, addition reaction, elimination reactions, substitution reactions, decomposition reactions etc.</li> </ul>	3	6
6	<b>Inorganic chemistry</b>	b4, c2	<ul style="list-style-type: none"> <li>Comparison between inorganic and organic compounds.</li> <li>Identification and reactions of common inorganic compounds <ul style="list-style-type: none"> <li>Cationic radicals</li> <li>Anionic radicals</li> </ul> </li> </ul>	3	6
Course Review and discussion session				1	2





FINAL - EXAM	1	2
<b>TOTAL</b>	16	32
<b>Number of Weeks /and Units Per Semester</b>	16 weeks	6 units

### B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Learning Outcomes
1.	Introduction to chemistry lab: safety, tools, instruments, scope of experiments and reporting assignments. Chemical structures (atoms, molecules, bonds) using models	1	2	c1, c2 a2
2.	pH- meter principle and standard operation procedure: determination of pH of water, weak acids / bases determination of pH of strong acids/bases, salts	1	2	c1, c2, c3, c4, d1, d2, d3, d4
3.	Preparation of buffers phosphate , citrate , acetate	1	2	c1, c2, c3, c4, d1, d2, d3, d4
4.	Oxidation reactions using potassium permanganate & Decomposition reaction of sodium bicarbonate in water.	1	2	c1, c2, c3, c4, d1, d2, d3, d4
5.	Acid/base reaction s e.g : HCl and NaOH	1	2	c1, c2, c3, c4, d1, d2, d3, d4
6.	Scheme Identification of cationic inorganic radicals	3	6	c1, c2, c3, c4, d1, d2, d3, d4
7.	Scheme Identification of anionic inorganic radicals	3	6	c1, c2, c3, c4, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		1	2	a2, c1, c2, c3, c4
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing, using the results in practical manner & for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve problems presented by the teacher on chemical formula, electronic configuration, quantum (molecular weight, molarity, normality), pH, ionization constant and pKa	b2	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search-report about one type of chemical reactions	a3	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion % of Total course Assessment	Aligned Course Learning Outcomes
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2 b3, b4, b6, b7
2	Assignments (1 + 2)	4-13, 14	5	5	a3, b2
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b5
4	Mid-semester exam of theoretical part ( written exam)	7	10	10	a1, a2, b1, b2 b3, b4, b6
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2 b3, b4, b6, b7
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes
1	Lab. Attendance	Weekly	5	5 %	b1, c1, c2, c3, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5 %	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5 %	b1, c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5 %	c2
5	Exam of practice theory (written exam or oral exam)	14	5	5 %	b1, c1, c2, c3
6	Practical exam (practical)	14	20	20 %	b1, c1, c2, c3
Total			40	40	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Cotton . Basic inorganic chemistry

### 2- Essential References.

2. Bothara. inorganic pharmaceutical chemistry
3. Richard E. Beil , General chemistry Lab. Manual, 2005, Dakota State university
4. British pharmacopeia, 2013

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of GENERAL CHEMISTRY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course concerns with study of basic concepts of chemistry as an introduction to specific pharmaceutical and medicinal chemistry courses.</p>





### III. Intended learning outcomes of the course: (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No	PILOs	Intended learning outcomes of the course (CILOs)
1.	A2	a1. Explain the roles of chemistry in modern sciences .
2.		a2. Explicit the chemical structures of matters and their chemical properties
3.	A3	a3. Discuss the principles and types of chemical reactions
4.	B1	b1. Interpret the type of chemical bond that form between atoms
5.	B2	b2 .Solve chemical problems related to chemical formula, electronic configuration , quantum (molecular weight, molarity, normality), pH, ionization constant and pKa
6.		b3. Classify types of electronic configuration, categories of elements based on periodical table, types of chemical compounds based on certain chemical properties such as acidity/basicity
7.		b4. Compare between the different types of chemistry disciplines and also between inorganic and organic compounds.
8.	B3	b5 .Express the chemical compounds and elements using abbreviate letters.
9.		b6. Relate the atom reactivity to electronic configuration to.
10.		b7. Predict the outcomes of a chemical reaction between two chemical entities.
11.	C1.	c1.Handle efficiently the tools and chemicals used in chemistry lab.
12.		c2. Operate successfully pH-meter and other instruments used in chemistry lab.
13.	C2	c3 .Perform effectively chemical experimentations including chemical reactions and identification in chemistry lab using standard procedures and provide report of his work.
14.	C3	c4 .Take the required safety criteria during performing experiments in chemistry lab.
15.	D1	d1. Work successfully in team-work during performing experiments in chemistry lab.
16.	D2	d2. Behave in discipline during performing experiments in chemistry lab.
17.	D3	D3. Communicate effectively with colleagues.
18.	D4	d4. Demonstrate the ability of time management, self-learning and problem-solving skills.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	written exam
a3	Lecture	written exam

### (b) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lectures	Written exam
b2, b3 , b4	Lecture, feed-back learning	written exam , assignment, quizzes
b5, b6 , b7	Lecture, feed-back learning	written exam, quizzes

### (c) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments, lab. reporting, practical exam )
c3	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
C4	Lab. Practice	Practical assessment (Lab accomplishment + practical exam )

### (d) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice	Practical assessment (Attitude)
d2	Lab. Practice,	Practical assessment (Lab Attitude)



d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	Aligned Course Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, b4	<ul style="list-style-type: none"> <li>chemistry (definition, brief history)</li> <li>disciplines of chemistry : general, organic, inorganic, analytical, medicinal, physical, etc.)</li> <li>importance and applications of chemistry in modern sciences.</li> </ul>	1	2
2	<b>Chemical structures</b>	a2, b1, b2, b3, b6	<ul style="list-style-type: none"> <li>atoms , atomic structure</li> <li>electronic configuration</li> <li>molecules and molecular formula,</li> <li>elements, periodic table of elements,</li> <li>compounds (types)</li> <li>chemical bonds (ionic, covalent, etc)</li> </ul>	3	6
3	<b>Chemical properties</b>	a2, b2	<ul style="list-style-type: none"> <li>electronegativity, dipole moments, polar and non-polar molecules</li> <li>acidity, basicity. (pH), ionization constant , pKa</li> <li>buffer systems</li> </ul>	2	4
<b>MID-TERM EXAM</b>				1	2
4	<b>Quantum in chemistry</b>	b2	<ul style="list-style-type: none"> <li>atomic weight, molecular weight, equivalent weight, milliequivalent, moles</li> <li>molarity, molality, normality</li> </ul>	2	4
5	<b>Chemical reactions and equilibrium</b>	a3, b7, c2	<ul style="list-style-type: none"> <li>chemical reactivity, inertness, energy change and heat of reaction</li> <li>chemical equations balance</li> <li>reactions catalysts</li> <li>acid-base reactions, Redox reactions, addition reaction, elimination reactions, substitution reactions, decomposition reactions etc.</li> </ul>	3	6
6	<b>Inorganic chemistry</b>	b4, c2	<ul style="list-style-type: none"> <li>Comparison between inorganic and organic compounds.</li> <li>Identification and reactions of common inorganic compounds <ul style="list-style-type: none"> <li>Cationic radicals</li> <li>Anionic radicals</li> </ul> </li> </ul>	3	6
<b>Course Review and discussion session</b>				1	2



FINAL - EXAM	1	2
<b>TOTAL</b>	16	32
<b>Number of Weeks /and Units Per Semester</b>	16 weeks	6 units

### B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Learning Outcomes
1.	Introduction to chemistry lab: safety, tools, instruments, scope of experiments and reporting assignments. Chemical structures (atoms, molecules, bonds) using models	1	2	c1, c2 a2
2.	pH- meter principle and standard operation procedure: determination of pH of water, weak acids / bases determination of pH of strong acids/bases, salts	1	2	c1, c2, c3, c4, d1, d2, d3, d4
3.	Preparation of buffers phosphate , citrate , acetate	1	2	c1, c2, c3, c4, d1, d2, d3, d4
4.	Oxidation reactions using potassium permanganate & Decomposition reaction of sodium bicarbonate in water.	1	2	c1, c2, c3, c4, d1, d2, d3, d4
5.	Acid/base reaction s e.g : HCl and NaOH	1	2	c1, c2, c3, c4, d1, d2, d3, d4
6.	Scheme Identification of cationic inorganic radicals	3	6	c1, c2, c3, c4, d1, d2, d3, d4
7.	Scheme Identification of anionic inorganic radicals	3	6	c1, c2, c3, c4, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		1	2	a2, c1, c2, c3, c4
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve problems presented by the teacher on chemical formula, electronic configuration , quantum (molecular weight, molarity, normality), pH, ionization constant and pKa	b2	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search-report about one type of chemical reactions	a3	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester





Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion % of Total course Assessment	Aligned Course Learning Outcomes
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2 b3, b4, b6, b7
2	Assignments (1 + 2)	4-13, 14	5	5	a3, b2
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b5
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, b1, b2 b3, b4, b6
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2 b3, b4, b6, b7
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes
1	Lab. Attendance	Weekly	5	5 %	b1, c1, c2, c3, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5 %	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5 %	b1, c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5 %	c2
5	Exam of practice theory (written exam or oral exam)	14	5	5 %	b1, c1, c2, c3
6	Practical exam (practical)	14	20	20 %	b1, c1, c2, c3
Total			40	40	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Cotton . Basic inorganic chemistry



<b>2- Essential References.</b>
2. Bothara. inorganic pharmaceutical chemistry 3. Richard E. Beleil , General chemistry Lab. Manual, 2005, Dakota State university 4. British pharmacopeia, 2013
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

<b>IX.Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### " INTRODUCTION TO PHARMACY HISTORY "

I. Course Identification and General Information:							
1.	Course Title:	INTRODUCTION TO PHARMACY HISTORY					
2.	Course Code &Number:						
3.	Credit hours:	C.H					TOTAL
		L.	Tut.	S.	P.	Tr.	
		2	-	-		-	2
4.	Study level/ semester at which this course is offered:	( first ) Year – ( 1 <sup>st</sup> ) semester					
5.	Pre –requisite (if any):	None					
6.	Co –requisite (if any):	None					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	2015					

I. Course Description:
The course provides essential introduction to pharmacy as profession, its past, current and future carriers.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A4	a1. Enumerate the current missions of pharmacy profession and the duties of pharmacists as drug experts.
2.		a2. Identify the basic pharmacy sciences, academic programs and the foundations that control pharmacy laws
3.		a3. Discuss the progress of pharmacy throughout history and its current and future development and fields.
4.		a4. Describe the current carriers of pharmacy profession and the new
5.	B2	b1. Classify drug risks and drug benefits.
6.	B3	b2. Relate the pharmacy progress to role of Arab and Muslims scientists.
7.	C4	c1. Use the media technologies to communicate, search and present thoughts
8.	D4	d1. demonstrate the ability to community and patients serving through understanding of his/her mission as drug experts.
9.		d2. demonstrate the ability to practice contemporary pharmacy in accordance with professional, legal and ethical standards.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4	Lecture, Lecture-discussion	written exam, assignment

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture, Lecture-discussion, feed-back learning	written exam, quizzes



<b>b2</b>	Lecture,Lecture-discussion, feed-back learning	written exam, quizzes
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
<b>c1</b>	Feed-back learning ,Group-project.	Assignment, Written- exam
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
<b>d1</b>	Lecture-discussion	Written exam
<b>d2</b>	Lecture-discussion	Written exam



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Pharmacy and pharmacists</b>	a1, a2, d2, d4	<ul style="list-style-type: none"> <li>definitions (pharmacy, pharmacist, drugs, medications, drug products)</li> <li>pharmacy motto</li> <li>Pharmacy profession missions</li> <li>foundations of pharmacy (world , Asian, Arabic and Yemeni)</li> <li>Relation of pharmacists with other health care professionals.</li> </ul>	2	4
2	<b>Current pharmacy practices</b>	a4, a2	<ul style="list-style-type: none"> <li>Pharmacy career opportunities (academic, industrial, researcher , developer, hospital, clinical and community pharmacists)</li> </ul>	2	4
3	<b>Education of pharmacy</b>	a2	<ul style="list-style-type: none"> <li>basic pharmacy sciences</li> <li>academic Baccalaureate programs, higher programs.</li> </ul>	1	2
4	<b>Pharmacists as drug experts</b>	b1,	<ul style="list-style-type: none"> <li>drugs benefits</li> <li>drugs risks</li> <li>Role of pharmacists as drug experts</li> <li>sources of information (primary, secondary, tertiary).</li> </ul>	1	2
<b>MID-TERM EXAM</b>				1	2
5	<b>History of pharmacy</b>	a1, b2	History of pharmacy in : <ul style="list-style-type: none"> <li>in Sumerian,</li> <li>Egyptian</li> <li>Chinese, Indian,</li> <li>Roman, Greek</li> <li>Arabic and Islamic</li> <li>Western civilization</li> </ul>	5	10
6	<b>Future aspects of pharmacy</b>	a2, a3	<ul style="list-style-type: none"> <li>factors influencing future of pharmacy</li> <li>current development of pharmacy profession</li> <li>newer pharmacy disciplines e.g. Complementary and alternative therapy, gene therapy and radiopharmacy</li> </ul>	2	4
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, c1, d1, d2	Review of the course topics by discussion session	1	2
<b>FINAL - EXAM</b>				1	2





TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	6 units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search-report on one of the newer pharmacy disciplines.	a3	4-13	6
2	<b>Group</b> : each group of students will be assigned to do a search report on one of the famous ancient Muslim Pharmacist	c1	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5 %	a1, a2, a3, a4, b1, b2, c1, d1, d2
2	Assignments (1 + 2)	4, 14	10	10 %	a3, c1
3	Quiz 1 + Quiz 2	7, 12	5	5 %	b1, b2
4	Mid-semester	7	20	20 %	a1, a2, a4, b1, d2, d4
5	Final exam	17	60	60 %	a1, a2, a3, a4, b1, b2, c1, d1, d2
TOTAL			100	100 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Lillian M. Azzopardi . Lecture notes in pharmacy practice, 2010, pharmaceutical press

### 2- Essential References.

1. Howard C. Ansel. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, , 2011, Lippincott Williams & Wilkins
2. Kevin M.G.Taylor. Pharmacy Practice, 2001, Taylor & Francis

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
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6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### INTRODUCTION TO PHARMACY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course provides essential introduction to pharmacy as profession, its past, current and future carriers.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A4	a1. Enumerate the current missions of pharmacy profession and the duties of pharmacists as drug experts.
2.		a2. Identify the basic pharmacy sciences, academic programs and the foundations that control pharmacy laws
3.		a3 . Discuss the progress of pharmacy throughout history and its current and future development and fields.
4.		a4. Describe the current carriers of pharmacy profession and the new
5.	B2	b1. Classify drug risks and drug benefits.
6.	B3	b2. Relate the pharmacy progress to role of Arab and Muslims scientists.
7.	C4	c1. Use the media technologies to communicate, search and present thoughts
8.	D2	d1.demonstrate the ability to community and patients serving through understanding of his/her mission as drug experts.
9.		d2.demonstrate the ability to practice contemporary pharmacy in accordance with professional, legal and ethical standards.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4	Lecture, Lecture-discussion	written exam , assignment

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture, Lecture-discussion , feed-back learning	written exam , quizzes



<b>b2</b>	Lecture, Lecture-discussion, feed-back learning	written exam, quizzes
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1</b>	Feed-back learning ,Group-project.	Assignment, Written- exam
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1</b>	Lecture-discussion	Written exam
<b>d2</b>	Lecture-discussion	Written exam





## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
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2	<b>Current pharmacy practices</b>	a4, a2	<ul style="list-style-type: none"> <li>Pharmacy career opportunities (academic, industrial, researcher , developer, hospital, clinical and community pharmacists)</li> </ul>	2	4
3	<b>Education of pharmacy</b>	a2	<ul style="list-style-type: none"> <li>basic pharmacy sciences</li> <li>academic Baccalaureate programs, higher programs.</li> </ul>	1	2
4	<b>Pharmacists as drug experts</b>	b1,	<ul style="list-style-type: none"> <li>drugs benefits</li> <li>drugs risks</li> <li>Role of pharmacists as drug experts</li> <li>sources of information (primary, secondary, tertiary).</li> </ul>	1	2
<b>MID-TERM EXAM</b>				1	2
5	<b>History of pharmacy</b>	a1, b2	History of pharmacy in : <ul style="list-style-type: none"> <li>in Sumerian,</li> <li>Egyptian</li> <li>Chinese, Indian,</li> <li>Roman, Greek</li> <li>Arabic and Islamic</li> <li>Western civilization</li> </ul>	5	10
6	<b>Future aspects of pharmacy</b>	a2, a3	<ul style="list-style-type: none"> <li>factors influencing future of pharmacy</li> <li>current development of pharmacy profession</li> <li>newer pharmacy disciplines e.g. Complementary and alternative therapy, gene therapy and radiopharmacy</li> </ul>	2	4
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, c1, d1, d2	Review of the course topics by discussion session	1	2
<b>FINAL - EXAM</b>				1	2



TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	6 units

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**lecture - Discussion**: a short lecture/ address followed by discussion

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search-report on one of the newer pharmacy disciplines.	a3	4-13	6
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## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
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2	Assignments (1 + 2)	4, 14	10	10 %	a3, c1
3	Quiz 1 + Quiz 2	7, 12	5	5 %	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20 %	a1, a2, a4, b1, d2, d4
5	Final exam of theoretical part ( written exam)	17	60	60 %	a1, a2, a3, a4, b1, b2, c1, d1, d2
TOTAL			100	100 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Lillian M. Azzopardi . Lecture notes in pharmacy practice, 2010, pharmaceutical press

### 2- Essential References.

1. Howard C. Ansel. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, , 2011, Lippincott Williams & Wilkins
2. Kevin M.G.Taylor. Pharmacy Practice, 2001, Taylor & Francis

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

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3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Specification

### " INTRODUCTION TO COMPUTER SCIENCE "

I. Course Identification and General Information:						
1.	Course Title:	INTRODUCTION TO COMPUTER SCIENCE				
2.	Course Code & Number:					
3.	Credit hours:	C.H				
		L.	Tut.	S.	P.	Tr.
		2	-	-	2	-
4.	Study level/ semester at which this course is offered:	( first ) Year – ( 1 <sup>st</sup> ) semester				
5.	Pre –requisite (if any):	None				
6.	Co –requisite (if any):	None				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10.	Prepared By:					
11.	Date of Approval	2015				

II. Course Description:
This course is designed for students to develop basic understanding of uses of computer and its applications in nursing.

### III. Intended learning outcomes (ILOs) of the course:

#### (A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>A3</b>	<b>a1.</b> Discuss various concepts used in computer and the disk operating system.	Lecture Discussion IT Practice Session	Written exam practical exam

#### (B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>B1</b>	<b>b1.</b> Interpret data of computer aided teaching and testing.	Lecture Discussion IT Practice Session	Written exam practical exam

#### C. Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>C4</b>	<b>c1</b> .Uses operating system, MS Office, multi-media, internet and Email.	Lecture Discussion IT Practice Session	Written exam practical exam

#### (D) Alignment Course Intended Learning Outcomes of General and Transferable Skills to Teaching Strategies and Assessment Strategies:

PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies



<b>D4</b>	<b>d1.</b> Demonstrate the ability of time management, self-learning and problem- solving.	Lecture Discussion IT Practice Session	Written exam practical exam
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## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	Introduction	<ul style="list-style-type: none"> <li>Concepts of Computers</li> <li>Hardware and software; trends and technology</li> </ul>	2	4	a1, b1
2	Introduction to disk-operating system	<ul style="list-style-type: none"> <li>DOS</li> <li>Windows (all version)</li> <li>Introduction to MS-Word</li> <li>MS-Excel with pictorial presentation</li> <li>MS-Access</li> <li>MS-Power point</li> </ul>	6	12	a1, b1
3	Midterm exam		1	2	a1, b1
4	Multimedia	<ul style="list-style-type: none"> <li>Types &amp; uses</li> <li>Computer aided teaching &amp; testing.</li> </ul>	2	4	a1, b1
5	Internet and e-mail	<ul style="list-style-type: none"> <li>Internet</li> <li>e-mail</li> </ul>	2	4	a1, b1
7	Final exam		1	2	a1, b1
<b>Number of Weeks /and Units Per Semester</b>			<b>15</b>	<b>30</b>	

## V. Teaching strategies of the course:

1. Lecture - Discussion
2. IT Practical session

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	medical Application of computers .	a1, b1, c1, d1	2-10	5

## VII. Schedule of Assessment Tasks for Students during the Semester: Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Activities	15th week	5	5%	a1, b1
2	Student assignment	5th and 12th week	5	5%	a1, b1,
3	Mid-term exam	7th or 8th week	10	10%	a1, b1
4	Final exam	16th-17th week	40	40 %	a1, b1
<b>Total Theory Weight</b>			<b>60</b>	<b>60%</b>	

Practical part					
Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Attitude	14 <sup>th</sup> week	5	5%	c1, d1
2	Semester work	1 <sup>st</sup> and 14 <sup>th</sup> week	10	10%	c1, d1
3	Final exam (theory or oral )	15 <sup>th</sup> week	5	5%	c1, d1
4	Final exam (practical)	16 <sup>th</sup> -17 <sup>th</sup> week	20	20%	c1, d1
Total Practical Weight			40	40%	

VIII. Learning Resources:	
1- Required Textbook(s) (maximum two ).	
	1. N.K. Anand & Shikha Goel (2009). Computers for Nurses, A.I.T.B.S. Publishers ,India.
2- Essential References.	
	2. Thacker N (2009). Computers for Nurses, India.
3- Electronic Materials and Web Sites <i>etc.</i>	
	1. <a href="http://www.google.com">www.google.com</a> 2. <a href="http://www.yahoo.com">www.yahoo.com</a>

IX. Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of " INTRODUCTION TO COMPUTER"

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail			X				

II. Course Description:
This course is designed for students to develop basic understanding of uses of computer and its applications in nursing.



### III. Intended learning outcomes (ILOs) of the course:

#### (A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>A3</b>	<b>a1.</b> Discuss various concepts used in computer and the disk operating system.	Lecture Discussion IT Practice Session	Written exam practical exam

#### (B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>B1</b>	<b>b1.</b> Interpret data of computer aided teaching and testing.	Lecture Discussion IT Practice Session	Written exam practical exam

#### C. Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>C4</b>	<b>c1</b> .Uses operating system, MS Office, multi-media, internet and Email.	Lecture Discussion IT Practice Session	Written exam practical exam

#### (D) Alignment Course Intended Learning Outcomes of General and Transferable Skills to Teaching Strategies and Assessment Strategies:

PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

<b>D4</b>	<b>d1.</b> Demonstrate the ability of time management, self-learning and problem- solving.	Lecture Discussion IT Practice Session	Written exam practical exam
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## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	Introduction	<ul style="list-style-type: none"> <li>Concepts of Computers</li> <li>Hardware and software; trends and technology</li> </ul>	2	4	a1, b1
2	Introduction to disk-operating system	<ul style="list-style-type: none"> <li>DOS</li> <li>Windows (all version)</li> <li>Introduction to MS-Word</li> <li>MS-Excel with pictorial presentation</li> <li>MS-Access</li> <li>MS-Power point</li> </ul>	6	12	a1, b1
3	Midterm exam		1	2	a1, b1
4	Multimedia	<ul style="list-style-type: none"> <li>Types &amp; uses</li> <li>Computer aided teaching &amp; testing.</li> </ul>	2	4	a1, b1
5	Internet and e-mail	<ul style="list-style-type: none"> <li>Internet</li> <li>e-mail</li> </ul>	2	4	a1, b1
7	Final exam		1	2	a1, b1
<b>Number of Weeks /and Units Per Semester</b>			<b>15</b>	<b>30</b>	

## V. Teaching strategies of the course:

1. Lecture - Discussion
2. IT lab session

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	medical Application of computers .	a1, b1, c1, d1	2-10	5

## VII. Schedule of Assessment Tasks for Students during the Semester: Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Activities	15th week	5	5%	a1, b1
2	Student assignment	5th and 12th week	5	5%	a1, b1,
3	Mid-term exam	7th or 8th week	10	10%	a1, b1
4	Final exam	16th-17th week	40	40 %	a1, b1
<b>Total Theory Weight</b>			<b>60</b>	<b>60%</b>	

Practical part					
Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Attitude	14 <sup>th</sup> week	5	5%	c1, d1
2	Semester work	1 <sup>st</sup> and 14 <sup>th</sup> week	10	10%	c1, d1
3	Final exam (theory or oral )	15 <sup>th</sup> week	5	5%	c1, d1
4	Final exam (practical)	16 <sup>th</sup> -17 <sup>th</sup> week	20	20%	c1, d1
Total Practical Weight			40	40%	

VIII. Learning Resources:	
1- Required Textbook(s) (maximum two ).	
	3. N.K. Anand & Shikha Goel (2009). Computers for Nurses, A.I.T.B.S. Publishers ,India.
2- Essential References.	
	4. Thacker N (2009). Computers for Nurses, India.
3- Electronic Materials and Web Sites <i>etc.</i>	
	3. <a href="http://www.google.com">www.google.com</a>
	4. <a href="http://www.yahoo.com">www.yahoo.com</a>

IX. Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.





## Course Specification of " ISLAMIC CULTURE"

I. Course Identification and General Information:					
1	Course Title:	Islamic culture			
2	Course Code &Number:				
3	Credit hours: 2	C.H			
		Th.	Seminar	Pr	Tr.
		2	-	-	-
4	Study level/ semester at which this course is offered:	First year/Second semester			
5	Pre –requisite:	-			
6	Co –requisite :	--			
7	Program (s) in which the course is offered:	Pharmacy BC			
8	Language of teaching the course:	Arabic			
9	Location of teaching the course:	College of medical Science			
10	Prepared By:				
11	Date of Approval	2015			

II. Course Description:
صمم هذا المقرر لتزويد الطالب بالمعارف، والمهارات، والاتجاهات السلوكية، اللازمة في مجال الثقافة والأخلاقيات الإسلامية المهنية، والتي تمكنه من التحلي بأخلاقيات الإسلام، والصفات التي تميزه عن غيره - في هذا المجال- ، والابتعاد عن المفسدات، ومحاولة تعزيز الثوابت، وإزالة السلبيات.



### III. Intended learning outcomes (ILOs) of the course:

#### (A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
A1	a1. الإلمام بالقوانين الطبية واللوائح المنظمة للمهنة ودورها في حماية الحياة.	Lecture Discussion	Essay type Short answer Objective type
A4	a2. إدراك أهمية تجنب الأخطاء في المهنة وعقوبتها في الشرع والقانون.	Lecture Discussion	Essay type Short answer Objective type

#### (B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
B1	b1. تفسير رأي الإسلام في بعض القضايا المعاصرة، وكيفية التعامل معها.	Lecture Discussion	Essay type Short answer Objective type

#### (C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
	Not applicable	-	-

#### (D) Alignment Course Intended Learning Outcomes of General and Transferable Skills to Teaching Strategies and Assessment Strategies:



PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
D2	d1. تميز مبادئ الإسلام في تأسيس الأسرة واستمرارها وإكساب الطلبة بعض المفاهيم العامة للأخلاقيات الإسلامية، وأثرها في حياة الأفراد.	Lecture Discussion	Essay type Short answer Objective type

#### IV. Course Content:

##### A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	تعريف الثقافة والحضارة	<ul style="list-style-type: none"> <li>■ تعريف الثقافة – الثقافة الإسلامية.</li> <li>■ تعريف الحضارة ومكوناتها، ومظاهرها.</li> <li>■ الفرق بين الثقافة والحضارة.</li> <li>■ مصادر الثقافة الإسلامية.</li> <li>■ خصائص الثقافة الإسلامية.</li> </ul>	2	4	b1
2	النظام العقدي في الإسلام	<ul style="list-style-type: none"> <li>■ تعريف العقيدة.</li> <li>■ أركان العقيدة الإسلامية.</li> <li>■ أثر العقيدة على الفرد والمجتمع.</li> </ul>	1	2	b1
3	النظام الاجتماعي في الإسلام	<ul style="list-style-type: none"> <li>■ تعريف النظام الاجتماعي.</li> <li>■ تعريف الأسرة وأهميتها، ومظاهر اهتمام الإسلام بالأسرة.</li> <li>■ مبادئ الإسلام في تأسيس الأسرة واستمرارها:</li> <li>- مبادئ تراعى قبل الإقدام على الزواج.</li> <li>- مبادئ تراعى بعد الزواج.</li> <li>- مبادئ تراعى عند حصول زعزعة أو خلاف أسري.</li> </ul>	1	2	d1
5	النظام السياسي في الإسلام:	<ul style="list-style-type: none"> <li>■ مفهوم النظام السياسي.</li> <li>■ أسس النظام السياسي في الإسلام:-</li> <li>- السيادة للشرع- السلطة للأمة.</li> </ul>	1	2	b1



		- للأمة حاكم واحد. - الشورى. - واجبات الحاكم وحقوقه في النظام السياسي.			
6	النظام الأخلاقي في الإسلام	<ul style="list-style-type: none"> <li>تعريف الأخلاق ومكانتها في الإسلام.</li> <li>الأخلاق كما وردت في القرآن الكريم.</li> <li>الأخلاق كما وردت في السنة النبوية.</li> <li>مفهوم أخلاقيات المهنة.</li> <li>مصادر وأهمية أخلاقيات المهنة.</li> <li>تصنيف القيم الأخلاقية المهنية.</li> </ul>	1	2	d1
7		امتحان نصف الفصل	1	2	b1, d1
8	هدي الإسلام في الصحة والحفاظ عليها	<ul style="list-style-type: none"> <li>الإسلام والصحة.</li> <li>الطب الوقائي في الإسلام.</li> </ul>	1	2	a1, a2, b1
9	أحكام شرعية وأخلاقية في بعض القضايا	<ul style="list-style-type: none"> <li>الاجهاض - عمليات التجميل - نقل الدم</li> <li>زراعة الأعضاء - الاستنساخ - وسائل منع الحمل.</li> </ul>	2	4	a1, a2, b1
10	تابع أحكام شرعية وأخلاقية في بعض القضايا	<ul style="list-style-type: none"> <li>تشريح الجثث - الموت الرحيم - الدواء والصوم.</li> <li>الأدوية والإدمان - التداوي بالأعشاب.</li> </ul>	1	2	a1, a2, b1
11	بعض المشكلات المعاصرة وكيف عالجها الإسلام	<ul style="list-style-type: none"> <li>سوء التغذية. - انتشار الأمراض المعدية.</li> <li>حكم وأثر ممارسة بعض العادات الضارة:</li> <li>• المخدرات - المهدئات. - اللواط. - العادة السرية.</li> </ul>	1	2	a1, a2, b1
12	قضايا معاصرة	<ul style="list-style-type: none"> <li>الغزو الفكري - الشورى في الإسلام - حقوق الإنسان في الإسلام.</li> </ul>	1	2	a1, a2, b1
13		امتحان نهائي	1	2	a1, a2, b1, d1
Number of Weeks /and Units Per Semester			15	30	

B - Practical Aspect:				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes



	Not applicable	-	-	-
Number of Weeks /and Units Per Semester				

## V. Teaching strategies of the course:

1. Lecture - Discussion

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	عادات وتقاليد الزواج في قريتك	D5	3-8	5

## VII. Schedule of Assessment Tasks for Students During the Semester Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Activities	15th week	5	5%	a1, a2, b1, d1
2	Student assignment	5th and 12th week	5	5%	d1
3	Mid-term exam	7th or 8th week	20	20%	b1, d1
4	Final exam	16th-17th week	70	70 %	a1, a2, b1, d1
Total Theory Weight			100	100%	

## Practical part

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
	Not applicable	-	-	-	-

## VIII. Learning Resources:

- 1- Required Textbook(s)



	١- الثقافة الإسلامية للدكتور/ عبد الحكيم بن عبد اللطيف السروري. ٢- أضواء على الثقافة الإسلامية د/ علي محمد الأهدل و د/ عبد الحكيم السروري.
<b>2- Essential References.</b>	
	١- الثقافة الإسلامية د/ عبد الغني حيدر. ٢- الموسوعة الفقهية الطبية د/ محمد أحمد كنعان. ٣- قانون الجرائم والعقوبات اليمني د/ علي حسن الشرفي
<b>3- Electronic Materials and Web Sites etc.</b>	
	١. <a href="http://www.google.com">www.google.com</a>

<b>IX. Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of INTRODUCTION TO ISLAMIC CULTURE

<b>I. Information about Faculty Member Responsible for the Course:</b>						
<b>Name of Faculty Member</b>		<b>Office Hours</b>				
<b>Location &amp; Telephone No.</b>		<b>SAT</b>	<b>SUN</b>	<b>MON</b>	<b>TUE</b>	<b>WED THU</b>





E-mail							
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## II. Course Description:

صمم هذا المقرر لتزويد الطالب بالمعارف، والمهارات، والاتجاهات السلوكية، اللازمة في مجال الثقافة والأخلاقيات الإسلامية المهنية، والتي تمكنه من التحلي بأخلاقيات الإسلام، والصفات التي تميزه عن غيره - في هذا المجال- ، والابتعاد عن المفسدات، ومحاولة تعزيز الثوابت، وإزالة السلبيات.

## III. Intended learning outcomes (ILOs) of the course:

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:			
PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
A1	a1. الإلمام بالقوانين الطبية واللوائح المنظمة للمهنة ودورها في حماية الحياة.	Lecture Discussion	Essay type Short answer Objective type



A4	a2. إدراك أهمية تجنب الأخطاء في المهنة وعقوبتها في الشرع والقانون.	Lecture Discussion	Essay type Short answer Objective type
<b>(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
B1	b1 تفسير رأي الإسلام في بعض القضايا المعاصرة، وكيفية التعامل معها.	Lecture Discussion	Essay type Short answer Objective type

<b>(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
	Not applicable	-	-
<b>(D) Alignment Course Intended Learning Outcomes of General and Transferable Skills to Teaching Strategies and Assessment Strategies:</b>			
PILO	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
D1	d1. تميز مبادئ الإسلام في تأسيس الأسرة واستمرارها وإكساب الطلبة بعض المفاهيم العامة للأخلاقيات الإسلامية، وأثرها في حياة الأفراد.	Lecture Discussion	Essay type Short answer Objective type

#### IV. Course Content:

##### A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
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1	تعريف الثقافة والحضارة	<ul style="list-style-type: none"> <li>■ تعريف الثقافة – الثقافة الإسلامية.</li> <li>■ تعريف الحضارة ومكوناتها، ومظاهرها.</li> <li>■ الفرق بين الثقافة والحضارة.</li> <li>■ مصادر الثقافة الإسلامية.</li> <li>■ خصائص الثقافة الإسلامية.</li> </ul>	2	4	b1
2	النظام العقدي في الإسلام	<ul style="list-style-type: none"> <li>■ تعريف العقيدة.</li> <li>■ أركان العقيدة الإسلامية.</li> <li>■ أثر العقيدة على الفرد والمجتمع.</li> </ul>	1	2	b1
3	النظام الاجتماعي في الإسلام	<ul style="list-style-type: none"> <li>■ تعريف النظام الاجتماعي.</li> <li>■ تعريف الأسرة وأهميتها، ومظاهر اهتمام الإسلام بالأسرة.</li> <li>■ مبادئ الإسلام في تأسيس الأسرة واستمرارها:</li> <li>- مبادئ تراعى قبل الإقدام على الزواج.</li> <li>- مبادئ تراعى بعد الزواج.</li> <li>- مبادئ تراعى عند حصول زعزعة أو خلاف أسري.</li> </ul>	1	2	d1
5	النظام السياسي في الإسلام:	<ul style="list-style-type: none"> <li>■ مفهوم النظام السياسي.</li> <li>■ أسس النظام السياسي في الإسلام:-</li> <li>- السيادة للشرع- السلطة للأمة.</li> <li>- للأمة حاكم واحد. - الشورى.</li> <li>- واجبات الحاكم وحقوقه في النظام السياسي.</li> </ul>	1	2	b1
6	النظام الأخلاقي في الإسلام	<ul style="list-style-type: none"> <li>■ تعريف الأخلاق ومكانتها في الإسلام.</li> <li>■ الأخلاق كما وردت في القرآن الكريم.</li> <li>■ الأخلاق كما وردت في السنة النبوية.</li> <li>■ مفهوم أخلاقيات المهنة.</li> <li>■ مصادر وأهمية أخلاقيات المهنة.</li> <li>■ تصنيف القيم الأخلاقية المهنية.</li> </ul>	1	2	d1
٧		■ امتحان نصف الفصل	1	2	b1, d1
٨	هدي الإسلام في الصحة والحفاظ عليها	<ul style="list-style-type: none"> <li>■ الإسلام والصحة.</li> <li>■ الطب الوقائي في الإسلام.</li> </ul>	1	2	a1, a2, b1



٩	أحكام شرعية وأخلاقية في بعض القضايا	<ul style="list-style-type: none"> <li>■ الاجهاض - عمليات التجميل - نقل الدم</li> <li>■ زراعة الأعضاء - الاستنساخ - وسائل منع الحمل.</li> </ul>	2	4	a1, a2, b1
١٠	تابع أحكام شرعية وأخلاقية في بعض القضايا	<ul style="list-style-type: none"> <li>■ تشريح الجثث - الموت الرحيم - الدواء والصوم.</li> <li>■ الأدوية والإدمان - التداوي بالأعشاب.</li> </ul>	1	2	a1, a2, b1
1١	بعض المشكلات المعاصرة وكيف عالجها الإسلام	<ul style="list-style-type: none"> <li>■ سوء التغذية. - انتشار الأمراض المعدية.</li> <li>■ حكم وأثر ممارسة بعض العادات الضارة: <ul style="list-style-type: none"> <li>● المخدرات - المهدئات.</li> <li>● اللواط. - العادة السرية.</li> </ul> </li> </ul>	1	2	a1, a2, b1
1٢	قضايا معاصرة	<ul style="list-style-type: none"> <li>■ الغزو الفكري - الشورى في الإسلام - حقوق الإنسان في الإسلام.</li> </ul>	1	2	a1, a2, b1
١٣	امتحان نهائي		١	٢	a1, a2, b1, d1
<b>Number of Weeks /and Units Per Semester</b>			<b>15</b>	<b>30</b>	

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
	<b>Not applicable</b>	-	-	-
<b>Number of Weeks /and Units Per Semester</b>				

<b>V. Teaching strategies of the course:</b>
2. Lecture - Discussion



## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	عادات وتقاليد الزواج في قريتك	D5	3-8	5

## VII. Schedule of Assessment Tasks for Students During the Semester Theoretical part

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance and Activities	15th week	5	5%	a1, a2, b1, d1
2	Student assignment	5th and 12th week	5	5%	d1
3	Mid-term exam	7th or 8th week	20	20%	b1, d1
4	Final exam	16th-17th week	70	70 %	a1, a2, b1, d1
<b>Total Theory Weight</b>			<b>100</b>	<b>100%</b>	

## Practical part

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
	Not applicable	-	-	-	-

## VIII. Learning Resources:

<b>1- Required Textbook(s)</b>	
	٣- الثقافة الإسلامية للدكتور/ عبد الحكيم بن عبد اللطيف السروري. ٤- أضواء على الثقافة الإسلامية د/ علي محمد الأهدل و د/ عبد الحكيم السروري.
<b>2- Essential References.</b>	
	٤- الثقافة الإسلامية د/ عبد الغني حيدر. ٥- الموسوعة الفقهية الطبية د/ محمد أحمد كنعان. ٦- قانون الجرائم والعقوبات اليمني د/ علي حسن الشرفي
<b>3- Electronic Materials and Web Sites etc.</b>	



### IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.





## Course Specification

### GENERAL BIOLOGY

I. Course Identification and General Information:						
1.	Course Title:	General biology				
2.	Course Code & Number:					
3.	Credit hours:	C.H				
		L.	Tut.	S.	P.	Tr.
		2	-	-	-	-
4.	Study level/ semester at which this course is offered:	( first ) Year – ( 1 <sup>st</sup> ) semester				
5.	Pre –requisite (if any):	None				
6.	Co –requisite (if any):	None				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10.	Prepared By:					
11.	Date of Approval	2015				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

This course provides basic knowledge of life including basic processes in living organisms, cell structure and function as well as inheritance of living organisms.



### III. Intended learning outcomes of the course(CILOs) and their alignment to Program Intended learning outcomes (PILOs)

NO.	PILOs	CILOS
1.	A1	a1. Identify the biological structures of living organisms, the common features of Life process& the common genera & species of animal kingdom.
2.		a2. Describe the functions & components of the cell as the basic unit of life.
3.		a3. Determine the basic processes in the cell and its life cycle.
4.	A2	a4. Explicit the Energy sources in living organisms
5.		a5. Explain the role of enzymes & the Chemical constituents of the protoplasm in the cell.
6.	A3	a6. Discuss Mendel experiments and the molecular basis of inheritance : chromosome, DNA, genes
7.	B2	b1. Classify living organisms into kingdoms, genera and species
8.		b2. Differentiate between living organisms& non-living things and between animal cell and plant cell.
9.	B3	b3. Relate hereditary to genetic factors.



**(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture	written exam , Practical assessment (Lab accomplishments, Lab. Reporting , practical exam)
a4, a5	Lecture, feed-back learning	written exam, assignment
a6	Lecture, feed-back learning, Group-project.	written exam , assignment

**(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	written exam , quizzes
b3	Lecture, feed-back learning	written exam, quizzes



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	<b>Scope of Biology</b>	a1, a2, b2	<ul style="list-style-type: none"> <li>Definitions and brief history of biology</li> <li>Living organisms and Non-Living things</li> <li>Chemical context of life</li> <li>Common features of Life process .</li> <li>Biological structures of living organisms: cell, tissue, organ, system.</li> <li>Energy sources in living organisms</li> </ul>	4	8
2	<b>The cell : the basic unit of life</b>	a3, a4, a5, b2	<ul style="list-style-type: none"> <li>Structure and components of the cell: cell membranes : types, Functions and properties, cytoplasm, Micro and macro molecules of cell</li> <li>Function of enzymes &amp; Chemical constituents of the protoplasm</li> <li>basic process in the cell (respiration, nutrition, etc.)</li> <li>life cycle of the cell mitosis and meiosis</li> <li>differences between animal and plant cell.</li> </ul>	4	8
<b>MID-TERM EXAM</b>				1	2
3	<b>animal kingdom</b>	a1, b1	<ul style="list-style-type: none"> <li>classification of living organisms into kingdoms, genera and species.</li> <li>Animal kingdoms classification : Genera and species; common features, diversity &amp; reproduction.</li> <li>Examples of common species of general of animal kingdoms and their anatomical features.</li> </ul>	3	6
4	<b>Inheritance</b>	a6, b3	<ul style="list-style-type: none"> <li>Mendel Experiments and the Gene Idea</li> <li>Molecular basis of inheritance : chromosome, DNA, genes</li> </ul>	2	4
<b>Course Review and discussion session</b>				1	2
<b>FINAL – EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16	4



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>lecture - Discussion</b>: a short lecture/ address followed by discussion</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search report of an enzyme/ chemical constituent in the cell	a5	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search-report about genetic elements	a6	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion % of Total course Assessment	Aligned Course Learning Outcomes
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, a4, a5, b1, b2, b3
2	Assignments (1 + 2)	4-13, 14	5	5	a5, a6
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b1, b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, a4, a5, b2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5, b1, b2, b3
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion % of Total course Assessment	Aligned Course Learning Outcomes
1	Lab. Attendance	Weekly	5	5	ALL
2	Lab. Attitude	weekly	2.5	2.5	d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, b1, c1, c2
4	Lab. Reporting	weekly	2.5	2.5	a1, c4, d1
5	Exam of practice theory (written exam or oral exam)	14	5	5	ALL
6	Practical exam (practical)	14	20	20	ALL
Total			40	40 %	





## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. A text book of Zoology

### 2- Essential References.

1. Sardana. A text book of pharmaceutical biology
2. Parthasarathi. Molecular biology of the cell

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification " MEDICAL TERMINOLOGY"

I. Course Identification and General Information:				
1	Course Title:	Medical terminology		
2	Course Code &Number:			
3	Credit hours: 4	C.H		
		L.	Tutorial	Pr
		2		-
4	Study level/ semester at which this course is offered:	First year/first semester		
5	Pre –requisite:			
6	Co –requisite :	English 1		
7	Program (s) in which the course is offered:			
8	Language of teaching the course:	English		
9	Location of teaching the course:	College of medical Science		
10	Prepared By:			
11	Date of Approval	2015		

II. Course Description:
<p>This course is designed to help the student acquire a good command and comprehension of the Medical English terminology through individual, papers and conferences. Students will practice their skills in verbal and written English during clinical and classroom experience.</p>



III. Alignment Course Intended Learning Outcomes (CILOs) to program intended learning outcomes (PILOs) , Teaching Strategies and Assessment Strategies		
1. Alignment Course Intended Learning Outcomes (CILOs) to program intended learning outcomes (PILOs)		
PILOs	CILO	
A3	a1. Identify the principles of basic structures and components of medical terms.	
B1	b1. Interpret medical terms .	
C4	c1. Use capably medical term to express medical conditions.	
D4	d4. Demonstrate the ability of self-learning	
2. Alignment Course Intended Learning Outcomes to Teaching Strategies and Assessment Strategies:		
CILO	Teaching strategies	Assessment Strategies
CILOs of knowledge & understanding		
a1. Identify the principles of basic structures and components of medical terms.	Lecture Lecture Discussion	Written exam , quizzes, assignments
CILOs of intellectual skills		
b1. Interpret medical terms .	Lecture Lecture Discussion	Written exam , quizzes, assignments
CILOs of practical & professional skills		
c1. Use capably medical term to express medical conditions.	Lecture Lecture Discussion	Written exam , quizzes, assignments
CILOs of general skills		
d1. Demonstrate the ability of self-learning	Feed-back learning	assignments



IV. Course Content:					
Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	Introduction	<ul style="list-style-type: none"> <li>Origin of medical terms</li> <li>Parts of a medical term: prefix, suffix, root</li> </ul>	1	2	a1, b1, c1, d1
2	Prefixes	<ul style="list-style-type: none"> <li>Prefixes related adjectives e.g. numeric (e.g. mono) , size" large and small" (e.g. micro, macro) , dimension "short (e.g. brachy) , speed" slow, fast (e.g. brady, tachy), location (intra, exter, per, ante, post) increased and decreased (e.g. hypo, hyper , mal, olig, a, an), different (e.g. dis, pseud, meta,) , colors (e.g. leuco, erytho)</li> </ul>	3	6	a1, b1, c1, d1
3	Suffixes	<ul style="list-style-type: none"> <li>Suffixes related to science (e.g. -logy, -logist), tests (-scope, -scopy, -----</li> <li>-graph, -graphy, , measurement (e.g. -meter), case (-ia, -iasis, -osis,) , diseases (e.g. -pathy, -oma, -neoplasm), operations( e.g. -ectomy)</li> </ul>	3	6	a1, b1, c1, d1
	Midterm exam		1	2	a1, b1, c1,



4	Roots of terms	<ul style="list-style-type: none"> <li>Roots related to body : <ul style="list-style-type: none"> <li>cells (e.g. cyte, cyto)</li> <li>tissues(hist) , organs (vaso, card)</li> <li>systems and organs</li> <li>physio, patho,</li> </ul> </li> </ul>	5	10	a1, b1, c1, d1
		<ul style="list-style-type: none"> <li>chemical names (glyc, hydr, chlor, proteo), sciences Multi-roots terms e.g. hyperglycemia</li> </ul>	1		a1, b1, c1, d1
5	No suffix or prefix terms	<ul style="list-style-type: none"> <li>Terms without suffix e.g. erythrocytes</li> <li>Terms without prefix e.g. cardiology</li> </ul>	1		a1, b1, c1, d1
5	Final exam		1	3	a1, b1, c1
Number of Weeks /and Units Per Semester			16	32	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Feed-back learning**: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation





VI. Assignments:				
No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework	d1	4-10	5

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5 %	a1, b1, c1, d1
2	Assignments (1 + 2)	4, 14	10	10 %	d1
3	Quiz 1 + Quiz 2	7, 12	5	5 %	b1
4	Mid-semester exam	7	20	20 %	a1, b1, c1, d1
5	Final exam	17	60	60 %	a1, b1, c1, d1
TOTAL			100	100 %	





VIII. Learning Resources:	
1- Required Textbook(s)	
	<ol style="list-style-type: none"> <li>1. Selva Rose. (1997), Career English for Nurses. Cheiu;ai: OientLongrnanLtd.</li> <li>2. Quirk, Randolph and Jreenbaum Sidney(1987). A University Grammar of English, Hong Kong: Longman group (FE) Ltd.</li> </ol>
2- Essential References.	
	<ol style="list-style-type: none"> <li>1. Thomson A. J. and Maitüiet A. V. (1987). A licticl English Grammar, Delhi: Oxford University Press.</li> <li>2. Gimson A. E. (1986). An Introduction to pronunciation of English. Hong kong: Wing King Tong Ca. Ltd.</li> <li>3. O' Connor J. D, (1986). Better English h'onuwiatiön. Cambridge:University Press.</li> </ol>
3- Electronic Materials and Web Sites etc.	
	<ol style="list-style-type: none"> <li>1. Http: // www.google. Com</li> <li>2. Http:// www.yahoo.com</li> </ol>

IX. Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACEUTICAL ANALYTICAL CHEMISTRY I

I. Course Identification and General Information:							
1.	Course Title:	PHARMACEUTICAL ANALYTICAL CHEMISTRY I					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:						
5.	Pre –requisite (if any):	• General chemistry					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of essential principles of analytical chemistry applied in pharmaceutical analysis in particular titrimetric analysis



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Define analysis and demonstrate its purposes and types (quantitative, qualitative) and the validation criteria including average, standard deviation, accuracy, precision and calibration.
2.		a2. Discuss the chemical principles and pharmaceutical applications of titrimetric analysis.
3.	A4	a3. Comprehend his/her role as pharmacist in perform accurate and precise quantitative and qualitative analysis of materials.
4.	B1	b1. Interpret data obtained after quantitative titrimetric analysis.
5.	B2	b2. Calculate the content % of a material in a sample using titrimetric analysis and solve the related problems.
6.		b3 . Classify analytical techniques into quantitative/qualitative and to manual /instrumental and categorize titrimetric analysis based on principle reactions.
7.		b4. Compare between various types of titrimetric analysis.
8.	B4	b5 . Assess the validation of a titrimetric analysis.
9.		b6. Select the appropriate titrimetric analysis method for quantitation of materials
10.	C1	c1.Handle efficiently the tools and chemicals used in chemistry Lab.
11.		c2. Operate successfully the instruments used in chemistry Lab.
12.	C2	c3 . Perform effectively titrimetric analysis of materials using standard procedures and avoiding the source of errors.
13.	C3	c4 .Take the required safety criteria during performing practical works in chemistry Lab.
14.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
15.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
16.	D1	d1. Share successfully in team-work.
17.	D2	d2. behave in discipline during practicing pharmacy works.
18.	D3	d3. Communicate effectively with his/her colleagues.
19.	D4	d4. Demonstrate time management and self-learning during performing practical works and assignments.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a7, a8	Lecture	Written exam , Attendance
a9	Lecture, laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b3	lecture, Lecture-discussion laboratory practice, Feed-back learning	Written exam , Attendance, assignment , Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes
b4	Lecture-discussion, laboratory practice Feed-back learning	Written exam , Attendance, assignment , Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam) , quizzes
b5, b6	Lecture, lab. practice	Written exam , Attendance, Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b10, b11	Lecture, lecture-discussion, laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning	Teaching strategies	Assessment Strategies
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Outcomes		
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d, d3, d4	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam), Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to analytical chemistry &amp; analytical techniques</b>	a1,a3, b1, b2,b3,b4, b6	<ul style="list-style-type: none"> <li>Definitions, brief history, scope of applications</li> <li>Quantitative and qualitative analysis (purposes , types)</li> <li>Validation of analysis                             <ul style="list-style-type: none"> <li>Source of errors</li> <li>Sampling procedures.</li> <li>calibration of analytical equipment</li> <li>preparation of standard solutions and calibration curve</li> <li>Analyzing of results : average, SD, coefficient of variation (CV%), accuracy , precision</li> <li>Significant numbers, rejection of doubtful values</li> </ul> </li> <li>Manual versus instrumental analytical techniques: types, advantages , disadvantages.</li> <li>Types &amp; comparison of titrimetric analysis</li> </ul>	4	12
2	<b>Aqueous Acid Base Titration</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>Definitions</li> <li>Distribution of acid-base species with pH of the medium.</li> <li>Acid-Base titrimetry for determination of weakly acidic and basic drugs.</li> <li>Indicators (theories) and their selection</li> <li>applications</li> </ul>	2	6
<b>MID-TERM EXAM</b>				1	2
3	<b>Non-Aqueous Acid Base Titrimetry 10</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>Theoretical considerations and principles.</li> <li>Bronsted Lowery of acids and bases.</li> <li>Non-aqueous solvents.</li> <li>Titration of weak acids and weak bases.</li> </ul>	3	9





			• Applications and scope of non-aqueous titrations.		
4	<b>Oxidation Reduction Titration</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>• Principles and concepts, determination involving oxidizing agents</li> <li>• iodimetric and iodometric determination, miscellaneous oxidation and reduction titrations. Indicators</li> <li>• applications.</li> <li>• chromometric determination, miscellaneous oxidation</li> </ul>	2	6
5	<b>Complexometric Titration</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>• Principle, Complexes and chelates, stability of complex ions.</li> <li>• Types of Complexometric titrations. Technique employed in complexometric titration, End point detection</li> </ul>	2	6
<b>Course Review</b>		a1, a2,a9, b3, b4,b6	a2,a3, b1, b2	1	3
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	46
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units



<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	introduction to the Lab.: safety requirements, list of experiments, How to report, source of errors, etc	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
2.	aqueous titration of weak acids e.g. acetic acid	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
3.	aqueous titration of weak acids e.g. citric acid	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
4.	aqueous titration of weak bases e.g. ammonium chloride	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
5.	non-aqueous titration of weak acids e.g. salicylic acid	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
6.	non-aqueous titration of weak bases	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
7.	Oxidation/reduction titration (iodometry) ; titration of H <sub>2</sub> O <sub>2</sub> using iodine	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
8.	Oxidation/reduction titration (chromometry) ; titration of iron using potassium dichromate	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
9.	titration (chromometry) ; titration of methanol using potassium dichromate	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
10.	Compleximetric titration of calcium salt	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
11.	Compleximetric titration of magnesium salt	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
PRACTICAL EXAM		1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provides the students with problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b2, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search report on pharmaceutical applications of one method of the studied titrimetric analysis.	c5, c6, d1, d2, d4	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1,a3, b2, b1, b2,b3,b4,b6
2	Assignments (1 + 2)	4-13, 14	5	5	b2,c5, c6, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b2
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1,a3, b2, b1, b2,b3,b4,b6
5	Final exam of theoretical part ( written exam)	17	40	40	a1,a3, b2, b1, b2,b3,b4,b6
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	d1, d2, d3,d4
3	Lab. Accomplishments	weekly	5	5	b5, c1, c2, c3,c4, c6, d4
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b5, c1, c2, c3,c4, c6, d4
6	Practical exam (practical)	14	20	20	b5, c1, c2, c3,c4, c6, d4
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Gary G. Christian, analytical chemistry, 2004, John Wiley & sons

### 2- Essential References.

1. Leslie G Chatten: Deans analytical chemistry handbook, 2003, McGraw Hill
2. Verma. Analytical chemistry

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### Pharmaceutical analytical chemistry I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of essential principles of analytical chemistry applied in pharmaceutical analysis in particular titrimetric analysis





### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 3. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Define analysis and demonstrate its purposes and types (quantitative, qualitative) and the validation criteria including average, standard deviation, accuracy, precision and calibration.
2.		a2. Discuss the chemical principles and pharmaceutical applications of titrimetric analysis.
3.	A4	a3. Comprehend his/her role as pharmacist in perform accurate and precise quantitative and qualitative analysis of materials.
4.	B1	b1. Interpret data obtained after quantitative titrimetric analysis.
5.	B2	b2. Calculate the content % of a material in a sample using titrimetric analysis and solve the related problems.
6.		b3 . Classify analytical techniques into quantitative/qualitative and to manual /instrumental and categorize titrimetric analysis based on principle reactions.
7.		b4. Compare between various types of titrimetric analysis.
8.	B4	b5 . Assess the validation of a titrimetric analysis.
9.		b6. Select the appropriate titrimetric analysis method for quantitation of materials
10.	C1	c1.Handle efficiently the tools and chemicals used in chemistry Lab.
11.		c2. Operate successfully the instruments used in chemistry Lab.
12.	C2	c3 . Perform effectively titrimetric analysis of materials using standard procedures and avoiding the source of errors.
13.	C3	c4 .Take the required safety criteria during performing practical works in chemistry Lab.
14.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
15.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
16.	D1	d1. Share successfully in team-work.
17.	D2	d2. behave in discipline during practicing pharmacy works.
18.	D3	d3. Communicate effectively with his/her colleagues.
19.	D4	d4. Demonstrate time management and self-learning during performing practical works and assignments.



#### 4. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a7, a8	Lecture	Written exam , Attendance
a9	Lecture, laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b3	lecture, Lecture-discussion laboratory practice, Feed-back learning	Written exam , Attendance, assignment , Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes
b4	Lecture-discussion, laboratory practice Feed-back learning	Written exam , Attendance, assignment , Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam) , quizzes
b5, b6	Lecture, lab. practice	Written exam , Attendance, Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b10, b11	Lecture, lecture-discussion, laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

##### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning	Teaching strategies	Assessment Strategies
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Outcomes		
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d, d3, d4	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam), Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to analytical chemistry &amp; analytical techniques</b>	a1,a3, b1, b2,b3,b4, b6	<ul style="list-style-type: none"> <li>Definitions, brief history, scope of applications</li> <li>Quantitative and qualitative analysis (purposes , types)</li> <li>Validation of analysis <ul style="list-style-type: none"> <li>Source of errors</li> <li>Sampling procedures.</li> <li>calibration of analytical equipment</li> <li>preparation of standard solutions and calibration curve</li> <li>Analyzing of results : average, SD, coefficient of variation (CV%), accuracy , precision</li> <li>Significant numbers, rejection of doubtful values</li> </ul> </li> <li>Manual versus instrumental analytical techniques: types, advantages , disadvantages.</li> <li>Types &amp; comparison of titrimetric analysis</li> </ul>	4	12
2	<b>Aqueous Acid Base Titration</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>Definitions</li> <li>Distribution of acid-base species with pH of the medium.</li> <li>Acid-Base titrimetry for determination of weakly acidic and basic drugs.</li> <li>Indicators (theories) and their selection</li> <li>applications</li> </ul>	2	6
<b>MID-TERM EXAM</b>				1	2
3	<b>Non-Aqueous Acid Base Titrimetry 10</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>Theoretical considerations and principles.</li> <li>Bronsted Lowery of acids and bases.</li> <li>Non-aqueous solvents.</li> <li>Titration of weak acids and weak bases.</li> </ul>	3	9



			• Applications and scope of non-aqueous titrations.		
4	<b>Oxidation Reduction Titration</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>• Principles and concepts, determination involving oxidizing agents</li> <li>• iodimetric and iodometric determination, miscellaneous oxidation and reduction titrations. Indicators</li> <li>• applications.</li> <li>• chromometric determination, miscellaneous oxidation</li> </ul>	2	6
5	<b>Complexometric Titration</b>	a2,a3, b1, b2,b6	<ul style="list-style-type: none"> <li>• Principle, Complexes and chelates, stability of complex ions.</li> <li>• Types of Complexometric titrations. Technique employed in complexometric titration, End point detection</li> </ul>	2	6
<b>Course Review</b>		a1, a2,a9, b3, b4,b6	a2,a3, b1, b2	1	3
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	46
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units



<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	introduction to the Lab.: safety requirements, list of experiments, How to report, source of errors, etc	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
2.	aqueous titration of weak acids e.g. acetic acid	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
3.	aqueous titration of weak acids e.g. citric acid	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
4.	aqueous titration of weak bases e.g. ammonium chloride	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
5.	non-aqueous titration of weak acids e.g. salicylic acid	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
6.	non-aqueous titration of weak bases	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
7.	Oxidation/reduction titration (iodometry) ; titration of H <sub>2</sub> O <sub>2</sub> using iodine	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
8.	Oxidation/reduction titration (chromometry) ; titration of iron using potassium dichromate	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
9.	titration (chromometry) ; titration of methanol using potassium dichromate	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
10.	Compleximetric titration of calcium salt	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
11.	Compleximetric titration of magnesium salt	1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
PRACTICAL EXAM		1	2	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	





## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

## VII. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provides the students with problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b2, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search report on pharmaceutical applications of one method of the studied titrimetric analysis.	c5, c6, d1, d2, d4	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1,a3, b2, b1, b2,b3,b4,b6
2	Assignments (1 + 2)	4-13, 14	5	5	b2,c5, c6, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b2
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1,a3, b2, b1, b2,b3,b4,b6
5	Final exam of theoretical part ( written exam)	17	40	40	a1,a3, b2, b1, b2,b3,b4,b6
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b5, c1, c2, c3,c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	d1, d2, d3,d4
3	Lab. Accomplishments	weekly	5	5	b5, c1, c2, c3,c4, c6, d4
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b5, c1, c2, c3,c4, c6, d4
6	Practical exam (practical)	14	20	20	b5, c1, c2, c3,c4, c6, d4
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Gary G. Christian, analytical chemistry, 2004, John Wiley & sons

### 2- Essential References.

1. Leslie G Chatten: Deans analytical chemistry handbook, 2003, McGraw Hill
2. Verma. Analytical chemistry

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACEUTICAL ORGANIC CHEMISTRY I

I. Course Identification and General Information:							
1.	Course Title:	PHARMACEUTICAL ORGANIC CHEMISTRY I					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:						
5.	Pre –requisite (if any):	General chemistry					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course concerns with study of the chemistry of carbon and essential classes of organic compounds including hydrocarbons, halo alkanes, alcohols, ethers, thioethers, an amines as an introduction to specific medicinal chemistry courses.



### III. Intended learning outcomes of the course: (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No	PILOs	Intended learning outcomes of the course (CILOs)
1.	A2	a1. Explain the significance of organic chemistry in modern sciences and .
2.	A3	a2. Discuss the properties of Carbon atom, models of structural formula, specific properties and mechanisms of reactions of organic compounds.
3.	B1	b1. Interpret the influence of functional group on physical and chemical properties of organic compounds.
4.		b2. Design a plan to synthesize an organic compound from a parent compound using serial thinking .
5.	B2	b3. Classify organic compounds based on functional group.
6.		b4. Differentiate between different types of organic compounds based on their physical properties, structural formula, molecular formula and chemical reactions
7.	B3	b5 . Name organic compounds using IUPAC nomenclature rules.
8.		b6. Relate functional group in organic compounds to the physical and chemical properties of the compounds.
9.		b7. Predict the catalysts required and the outcomes of a reaction between an organic compound and other chemicals.
10.	C1.	c1. Handle efficiently the tools and chemicals used in chemistry lab.
11.		c2. Operate successfully the instruments used in chemistry lab.
12.	C2	c3 . Perform effectively experimentations of chemical reactions including identification and synthesis of organic compounds in chemistry lab using standard procedures and provide report of his work.
13.		c4 . Draw the structure of organic compounds using structural formula.
14.	C3	c6 .Take the required safety criteria during performing experiments in chemistry lab.
15.	D1	d1. Share successfully in team-work .
16.	D2	d2. Behave in discipline during performing experiments in chemistry lab
17.	D3	d3.. Communicate effectively with his/her colleagues during performing experiments in chemistry lab.
18.	D4	d4. Demonstrate time management during performing experiments in chemistry lab.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, Lecture-discussion	written exam
a2	Lecture, Lecture-discussion	written exam

### (b) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1 , b2	Lectures	Written exam
b3, b4	Lecture, Lecture-discussion , feed-back learning	written exam , assignment, quizzes
b5, b6, b7	Lecture, Lecture-discussion, feed-back learning	written exam, quizzes

### (c) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments, lab. reporting, practical exam )
c3, c4	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c5	Lab. Practice	Practical assessment (Lab accomplishment + practical exam )

### (d) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice	Practical assessment (Attitude)
d2	Lab. Practice,	Practical assessment (Lab Attitude)
d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)





## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	Aligned Course Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to organic chemistry</b>	a1, a2	<ul style="list-style-type: none"> <li>definition, brief history</li> <li>significance of organic chemistry in modern sciences</li> <li>Carbon chemistry: carbon atomic structure, chemical bonds, atomic Orbitals and electron configuration; <math>sp^3</math>, <math>sp^2</math>, <math>sp</math> hybridization</li> <li>Physical state</li> <li>Stereochemistry of organic compounds</li> <li>isomerism</li> <li>Resonance</li> <li>dipole moment</li> <li>structural theory</li> <li>Models of Structural formula (all-stick formula, dot formula, dash formula, condensed formula, bond-line formula)</li> </ul>	2	4
2	<b>Functional groups &amp; Classification of organic compounds</b>	b1, b2, b3, b4, b5, b6, c4	<ul style="list-style-type: none"> <li>Definition and types of functional groups</li> <li>classification into categories based on functional groups.</li> <li>Role of functional group in physical &amp; chemical properties of organic compounds.</li> <li>Common names Origin</li> <li>IUPAC Nomenclature priority ( which functional group is more important ?)</li> <li>Differences between aliphatic &amp; aromatic organic compounds</li> </ul>	2	4
3	<b>Hydrocarbons</b>	b1, b2, b3, b4, b5, b6, b7, c4	<p>(1) <b>Aliphatic (Alkanes, Alkenes, Alkynes, cycloalkanes, cycloalkenes):</b> definitions, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, synthesis and reactions (including mechanisms of reactions).</p> <p>(2) <b>Aromatic hydrocarbon</b> (definitions,</p>	2	4



			types, general formula, structural models, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, , synthesis and reactions (including mechanisms of reactions).		
	MID TERM EXAM			1	2
4	<b>Haloalkanes</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li><b>Aliphatic and aromatic Alkyl halides (Haloalkanes)</b> and organometallic compounds: (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions).</li> </ul>	2	4
5	<b>Aliphatic and aromatic Alcohols , ethers and thioethers</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>(definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, synthesis reactions (including mechanisms of reactions).</li> </ul>	3	6
6	<b>Aliphatic and aromatic Amines</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>(definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, synthesis and reactions)</li> </ul>	2	4
7	<b>Serial synthesis</b>	b2	Synthesis of an organic compound starting from simple parent organic compound.	1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	7 units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Learning Outcomes</b>
<b>1.</b>	Introduction to chemistry lab: safety, tools, instruments, scope of experiments and reporting assignments.	<b>1</b>	<b>2</b>	c1, c2
<b>2.</b>	Physicochemical properties , reactions & synthesis of aliphatic hydrocarbons	<b>1</b>	<b>2</b>	a2
<b>3.</b>	Chemical reactions & synthesis of aromatic hydrocarbons	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>4.</b>	Physicochemical properties , reactions & synthesis of haloalkanes	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>5.</b>	Physicochemical properties , reactions & synthesis of aliphatic alcohols	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>6.</b>	Physicochemical properties , reactions & synthesis of aromatic alcohols	<b>2</b>	<b>4</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>7.</b>	Physicochemical properties , reactions & synthesis of amines	<b>2</b>	<b>4</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>8.</b>	Scheme Identification of cationic inorganic radicals	<b>2</b>	<b>4</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	a2, c1, c2, c3, c4
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>lecture - Discussion</b>: a short lecture/ address followed by discussion</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	<p><b>Individual</b>: every student is assigned to solve problems at home. The problems are provided by the teacher at the end of each unit. Problems are related to completion of a chemical reaction, nomenclature, draw structures, mechanisms of reactions and others. The student should deliver his/her work every second week in a specific homework booklet. The teacher may ask the student, either personally, or at the class to make sure that the student work belongs to his/her lonely effort.</p>	b2	4- 13	3
2	<p><b>Group</b> : each group of students will be assigned to do a search-report about one type the mechanism of a reaction.</p>	a3	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion % of Total course Assessment	Aligned Course Learning Outcomes
1	Attendance	1 - 15	2	2	a1, a2 b1, b2, b3, b4, b5, b6, b7, c4
2	Assignments (1 + 2)	4, 14	5	5	a3, b2
3	Quiz 1 + Quiz 2	5, 12	3	3	b2, b5, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2 b1, b2, b3, b4, b5, b6, c4
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2 b1, b2, b3, b4, b5, b6, b7, c4
TOTAL			60	60 %	

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes
1	Lab. Attendance	Weekly	5	5 %	b1, c1, c2, c3, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5 %	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5 %	b1, c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5 %	c2
5	Exam of practice theory (written exam or oral exam)	14	5	5 %	b1, c1, c2, c3
6	Practical exam (practical)	14	20	20 %	b1, c1, c2, c3
Total			40	40	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Cotton . Basic inorganic chemistry

### 2- Essential References.

2. Bothara. inorganic pharmaceutical chemistry
3. Richard E. Beil , General chemistry Lab. Manual, 2005, Dakota State university
4. British pharmacopeia, 2013

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### PHARMACEUTICAL ORGANIC CHEMISTRY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	-----	Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail	-----						

### II. Course Description:

The course concerns with study of the chemistry of carbon and essential classes of organic compounds including hydrocarbons, halo alkanes, alcohols, ethers, thioethers, an amines as an introduction to specific medicinal chemistry courses.





### III. Intended learning outcomes of the course: (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No	PILOs	Intended learning outcomes of the course (CILOs)
1.	A2	a1. Explain the significance of organic chemistry in modern sciences and .
2.	A3	a2. Discuss the properties of Carbon atom, models of structural formula, specific properties and mechanisms of reactions of organic compounds.
3.	B1	b1. Interpret the influence of functional group on physical and chemical properties of organic compounds.
4.		b2. Design a plan to synthesize an organic compound from a parent compound using serial thinking .
5.	B2	b3. Classify organic compounds based on functional group.
6.		b4. Differentiate between different types of organic compounds based on their physical properties, structural formula, molecular formula and chemical reactions
7.	B3	b5 . Name organic compounds using IUPAC nomenclature rules.
8.		b6. Relate functional group in organic compounds to the physical and chemical properties of the compounds.
9.		b7. Predict the catalysts required and the outcomes of a reaction between an organic compound and other chemicals.
10.	C1.	c1. Handle efficiently the tools and chemicals used in chemistry lab.
11.		c2. Operate successfully the instruments used in chemistry lab.
12.	C2	c3 . Perform effectively experimentations of chemical reactions including identification and synthesis of organic compounds in chemistry lab using standard procedures and provide report of his work.
13.		c4 . Draw the structure of organic compounds using structural formula.
14.	C3	c6 .Take the required safety criteria during performing experiments in chemistry lab.
15.	D1	d1. Share successfully in team-work .
16.	D2	d2. Behave in discipline during performing experiments in chemistry lab
17.	D3	d3.. Communicate effectively with his/her colleagues during performing experiments in chemistry lab.
18.	D4	d4. Demonstrate time management during performing experiments in chemistry lab.



## 1. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, Lecture-discussion	written exam
a2	Lecture, Lecture-discussion	written exam

### (b) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1 , b2	Lectures	Written exam
b3, b4	Lecture, Lecture-discussion , feed-back learning	written exam , assignment, quizzes
b5, b6, b7	Lecture, Lecture-discussion, feed-back learning	written exam, quizzes

### (c) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments, lab. reporting, practical exam )
c3, c4	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c5	Lab. Practice	Practical assessment (Lab accomplishment + practical exam )

### (d) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice	Practical assessment (Attitude)
d2	Lab. Practice,	Practical assessment (Lab Attitude)
d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	Aligned Course Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to organic chemistry</b>	a1, a2	<ul style="list-style-type: none"> <li>definition, brief history</li> <li>significance of organic chemistry in modern sciences</li> <li>Carbon chemistry: carbon atomic structure, chemical bonds, atomic Orbitals and electron configuration; <math>sp^3</math>, <math>sp^2</math>, <math>sp</math> hybridization</li> <li>Physical state</li> <li>Stereochemistry of organic compounds</li> <li>isomerism</li> <li>Resonance</li> <li>dipole moment</li> <li>structural theory</li> <li>Models of Structural formula (all-stick formula, dot formula, dash formula, condensed formula, bond-line formula)</li> </ul>	2	4
2	<b>Functional groups &amp; Classification of organic compounds</b>	b1, b2, b3, b4, b5, b6, c4	<ul style="list-style-type: none"> <li>Definition and types of functional groups</li> <li>classification into categories based on functional groups.</li> <li>Role of functional group in physical &amp; chemical properties of organic compounds.</li> <li>Common names Origin</li> <li>IUPAC Nomenclature priority ( which functional group is more important ?)</li> <li>Differences between aliphatic &amp; aromatic organic compounds</li> </ul>	2	4
3	<b>Hydrocarbons</b>	b1, b2, b3, b4, b5, b6, b7, c4	<p><b>(3) Aliphatic (Alkanes, Alkenes, Alkynes, cycloalkanes, cycloalkenes):</b></p> <p>definitions, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, synthesis and reactions (including mechanisms of reactions).</p>	2	4



			(4) <b>Aromatic hydrocarbon</b> (definitions, types, general formula, structural models, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, , synthesis and reactions (including mechanisms of reactions).		
	MID TERM EXAM			1	2
4	<b>Haloalkanes</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li><b>Aliphatic and aromatic Alkyl halides (Haloalkanes)</b> and organometallic compounds: (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions).</li> </ul>	2	4
5	<b>Aliphatic and aromatic Alcohols , ethers and thioethers</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>(definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, synthesis reactions (including mechanisms of reactions).</li> </ul>	3	6
6	<b>Aliphatic and aromatic Amines</b>	b1, b2, b3, b4, b5, b6, b7, c4	<ul style="list-style-type: none"> <li>(definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, synthesis and reactions)</li> </ul>	2	4
7	<b>Serial synthesis</b>	b2	Synthesis of an organic compound starting from simple parent organic compound.	1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	7 units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Learning Outcomes</b>
<b>1.</b>	Introduction to chemistry lab: safety, tools, instruments, scope of experiments and reporting assignments.	<b>1</b>	<b>2</b>	c1, c2
<b>2.</b>	Physicochemical properties , reactions & synthesis of aliphatic hydrocarbons	<b>1</b>	<b>2</b>	a2
<b>3.</b>	Chemical reactions & synthesis of aromatic hydrocarbons	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>4.</b>	Physicochemical properties , reactions & synthesis of haloalkanes	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>5.</b>	Physicochemical properties , reactions & synthesis of aliphatic alcohols	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>6.</b>	Physicochemical properties , reactions & synthesis of aromatic alcohols	<b>2</b>	<b>4</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>7.</b>	Physicochemical properties , reactions & synthesis of amines	<b>2</b>	<b>4</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>8.</b>	Scheme Identification of cationic inorganic radicals	<b>2</b>	<b>4</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	a2, c1, c2, c3, c4
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve problems at home. The problems are provided by the teacher at the end of each unit. Problems are related to completion of a chemical reaction, nomenclature, draw structures, mechanisms of reactions and others. The student should deliver his/her work every second week in a specific homework booklet. The teacher may ask the student, either personally, or at the class to make sure that the student work belongs to his/her lonely effort.	b2	4- 13	3
2	<b>Group</b> : each group of students will be assigned to do a search-report about one type the mechanism of a reaction.	a3	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion % of Total course Assessment	Aligned Course Learning Outcomes
1	Attendance	1 - 15	2	2	a1, a2 b1, b2, b3, b4, b5, b6, b7, c4
2	Assignments (1 + 2)	4, 14	5	5	a3, b2
3	Quiz 1 + Quiz 2	5, 12	3	3	b2, b5, b7
4	Mid-semester exam of theoretical part (written exam)	7	10	10	a1, a2 b1, b2, b3, b4, b5, b6, c4
5	Final exam of theoretical part (written exam)	17	40	40	a1, a2 b1, b2, b3, b4, b5, b6, b7, c4
TOTAL			60	60 %	

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes
1	Lab. Attendance	Weekly	5	5 %	b1, c1, c2, c3, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5 %	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5 %	b1, c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5 %	c2
5	Exam of practice theory (written exam or oral exam)	14	5	5 %	b1, c1, c2, c3
6	Practical exam (practical)	14	20	20 %	b1, c1, c2, c3
Total			40	40	





## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Cotton . Basic inorganic chemistry

### 2- Essential References.

2. Bothara. inorganic pharmaceutical chemistry
3. Richard E. Beil , General chemistry Lab. Manual, 2005, Dakota State university
4. British pharmacopeia, 2013

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### **BIOPHYSICS&PHYSICAL PHARMACY**

I. Course Identification and General Information:							
1.	Course Title:	BIOPHYSICS&PHYSICAL PHARMACY					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2		-			-
4.	Study level/ semester at which this course is offered:						
5.	Pre –requisite (if any):	-					
6.	Co –requisite (if any):						
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

This course deals with study of the various physical phenomena applied or observed in pharmacy in particular pharmaceutical dosage forms design and formulation. Therefore, this course can be referred so as to introduction to "pharmaceutics" courses.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the physical properties that exist between molecules of the same matter and those existing as interaction between two or more matters.
2.	A3	a2. Discuss certain physical phenomena that are applied or frequently observed in pharmacy practice.
3.	A4	a3. Recognize the role of pharmacist in applying the rules of physics in pharmacy practice.
4.	B1	b1. Solve mathematical problems related to physical pharmacy.
5.	B2	b2. Relate physical phenomena to their affecting factors.
6.	B3	b3. Interpret scientifically the sequence and outcomes of certain physical phenomena related to pharmacy practice. Formulate /develop
7.	B4	b4. Assess the pharmaceutical applications of various physical phenomena.
8.	C1	c1. Handle efficiently the tools and chemicals used in physical pharmacy Lab.
9.		c2. Operate successfully the instruments used in physical pharmacy Lab.
10.	C2	c3. Perform effectively the experiments for determination of certain physical parameters in physical pharmacy Lab.
11.	C3	c4. Take the required safety criteria during performing experiments in physical pharmacy Lab.
12.	C4	c5. Use efficiently different types of information sources to search and report certain search assignments related to the studied topics.
13.	D1	d1. Share successfully in a team-work.
14.	D2	d2. behave in discipline during performing experiments in physical pharmacy Lab.
15.	D3	d3. Communicate effectively with colleagues
16.	D4	d4. Demonstrate the ability of time management, self-learning and problem solving skills.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, Lecture-discussion , feed-back learning	written exam
a2	Lecture, Lecture-discussion,, feed-back learning	written exam
a3	Lecture, Lecture-discussion, Laboratory practice	written exam, practical assessment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lab practice ,Feed-back learning , feed-back learning.	Written exam, practical assessment (lab. accomplishment, practical exam), assignments
b2	Lecture,Lecture-discussion , feed-back learning	written exam , quizzes
b3	Lecture,Lecture-discussion, feed-back learning	written exam, quizzes
b4	Lecture , Laboratory practice	written exam , practical assessment ( Practical exam)

### (c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )



c3	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c4	Lab. Practice	Practical assessment (Lab activity + practical exam )
c5	Feed-back learning ,Group-project.	Written- exam , practical assessment (Lab. Reporting),assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1	Lab. Practice ,Group-project , , feed-back learning	Assignment , Practical assessment (Lab Reporting & Attitude) , assignment
d2.	Lab. Practice ,Group-project,	Practical assessment (Lab Attitude)
d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice, feed-back learning	Practical assessment (Lab Attitude) ,assignment



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to physical pharmacy</b>	a1, a2, a3, b2	<ul style="list-style-type: none"> <li>• Scope and purposes of physical pharmacy</li> <li>• State of matters : factors affecting ( intermolecular forces, vapor pressure, atmospheric pressure, thermal energy)</li> <li>• Circle of interconversion of a matter from a state of state ; name of processes, factors affecting</li> <li>• Pharmaceutical Application of interconversion of matters in pharmacy</li> </ul>	2	4
2	<b>solid state physical properties</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>• Melting points of solids</li> <li>• Liquifiction of mixed solids</li> <li>• Crystallization : principles and applications</li> <li>• Amorphous and crystalline forms</li> <li>• Polymorphism, hydrates, anhydrous</li> <li>• Micrometrics : particle size definition, analysis</li> <li>• Tapped and bulk density</li> <li>• porosity, flowability and Carr`s index</li> <li>• Mathematical problems related to the studied topics</li> <li>• summary of Pharmaceutical Applications of solid state properties.</li> </ul>	3	6
	<b>liquid states physical properties</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>• evaporation, boiling, vaporization and volatilization</li> <li>• Viscosity and types of flow of fluids</li> <li>• Mathematical problems related to the studied topics</li> <li>• Pharmaceutical Applications of liquid state properties.</li> </ul>	2	4



MID-TERM EXAM				1	2
4	<b>Gas state physical properties</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>Ideal gases and Real gases</li> <li>Laws and equations of ideal and real gases</li> <li>Aerosols :principles and applications</li> </ul>	1	2
5	<b>Physical interactions between matters</b>	a1, a2, a3, b1, b2, b3, b4	<p>Principles, equations, factors and problems of the following physical matters interactions:</p> <ul style="list-style-type: none"> <li>solubility , miscibility and dissolution</li> <li>insolubility and immiscibility</li> <li>dispersion and surface tensions (Solid dispersion in liquids , Liquid dispersion in liquids)</li> <li>Sedimentation</li> <li>Colaescences</li> <li>partition coefficient: hydrophilicity and lipophilicity</li> <li>Adsorption</li> <li>Complexation</li> <li>Mathematical problems related to the studied topics</li> <li>Summary of pharmaceutical applications of the</li> </ul>	3	6
6	<b>Stability and degradation kinetics</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>Degradation of matters : definition and types of degradation, definition of stability, factors enhancing degradation, approaches to reduce or limit degradation</li> <li>Orders of degradarion (zero,first, second)</li> <li>Degradation parameters: degradation rate constant, half-life(<math>t_{1/2}</math>) , shelf life (<math>t_{90}</math>)</li> <li>Mathematical problems related to degradation order kinetics</li> </ul>	3	6
<b>Course Review</b>		a1, a2, a3, b1, b2, b3, b4	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2





<b>TOTAL</b>	16	32
<b>Number of Weeks /and Units Per Semester</b>	16 weeks	6 Units



B - Practical Aspect:				
Order	Tasks/ Experiments	Number of Weeks	contact hours	AlignedCourse Intended Learning Outcomes CILOs
1.	introduction to Lab.: safety requirements, list of experiments, How to report, etc + liquefaction of solids	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
2.	Tapped and bulk density porosity and Carr`s index of flowability description ..	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
3.	Crystallization phenomena	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
4.	Density of l liquids	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
5.	Viscosity determination	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
6.	Particle size determination (sedimentation method)	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
7.	Surface tension determination (Drop weight method)	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
8.	Solubility description	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
9.	Adsorption phenomenon	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
10.	Partition coefficient determination	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
11.	Review	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, home-works, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with mathematical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b1,	4-13	3
2	<b>Group</b> : each group of students will be assigned to make a search-report supported by illustrating videos on one of the studied physical phenomenon.	c5, d1	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2, b3, b4
2	Assignments (1 + 2)	4-13 , 14	5	5	b1, c5, d1,
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b1, b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, b1, b2, b3, b4
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2, b3, b4
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	c1, c2, c3, c4, d1, d2, d3, d4,
2	Lab. Attitude	weekly	2.5	2.5	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5	c1, c2
4	Lab. Reporting	weekly	2.5	2.5	c5, d1
5	Exam of practice theory (written exam or oral exam)	14	5	5	c1, c2, c3, c4, d1, d2, d3, d4,
6	Practical exam (practical)	14	20	20	c1, c2, c3, c4, d1, d2, d3, d4,
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Martin`s : Physical pharmacy and pharmaceutical sciences, 2011, Lippincott Williams & Wilkins, UK

### 2- Essential References.

1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
2. Subrahmanyam. A text book of physical pharmaceutics, 2015, VallabhPrakashan, India
3. R.S. Gaud G.T. Gupta practical physical pharmacy, 2012, CBS, USA

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of PHYSICAL PHARMACY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>This course deals with study of the various physical phenomena applied or observed in pharmacy in particular pharmaceutical dosage forms design and formulation. Therefore, this course can be referred so as to introduction to "pharmaceutics" courses.</p>



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the physical properties that exist between molecules of the same matter and those existing as interaction between two or more matters.
2.	A3	a2. Discuss certain physical phenomena that are applied or frequently observed in pharmacy practice.
3.	A4	a3. Recognize the role of pharmacist in applying the rules of physics in pharmacy practice.
4.	B1	b1. Solve mathematical problems related to physical pharmacy.
5.	B2	b2. Relate physical phenomena to their affecting factors.
6.	B3	b3. Interpret scientifically the sequence and outcomes of certain physical phenomena related to pharmacy practice. Formulate /develop
7.	B4	b4. Assess the pharmaceutical applications of various physical phenomena.
8.	C1	c1. Handle efficiently the tools and chemicals used in physical pharmacy Lab.
9.		c2. Operate successfully the instruments used in physical pharmacy Lab.
10.	C2	c3. Perform effectively the experiments for determination of certain physical parameters in physical pharmacy Lab.
11.	C3	c4. Take the required safety criteria during performing experiments in physical pharmacy Lab.
12.	C4	c5. Use efficiently different types of information sources to search and report certain search assignments related to the studied topics.
13.	D1	d1. Share successfully in a team-work.
14.	D2	d2. behave in discipline during performing experiments in physical pharmacy Lab.
15.	D3	d3. Communicate effectively with colleagues
16.	D4	d4. Demonstrate the ability of time management, self-learning and problem solving skills.





## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, Lecture-discussion , feed-back learning	written exam
a2	Lecture, Lecture-discussion,, feed-back learning	written exam
a3	Lecture, Lecture-discussion, Laboratory practice	written exam, practical assessment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lab practice ,Feed-back learning , feed-back learning.	Written exam, practical assessment (lab. accomplishment, practical exam), assignments
b2	Lecture, Lecture-discussion , feed-back learning	written exam , quizzes
b3	Lecture, Lecture-discussion, feed-back learning	written exam, quizzes
b4	Lecture , Laboratory practice	written exam , practical assessment ( Practical exam)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )



<b>c3</b>	<b>Lab. Practice</b>	<b>Practical assessment (Lab accomplishments + practical exam )</b>
<b>c4</b>	<b>Lab. Practice</b>	<b>Practical assessment (Lab activity + practical exam )</b>
<b>c5</b>	<b>Feed-back learning ,Group-project.</b>	<b>Written- exam , practical assessment (Lab. Reporting),assignments</b>
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1</b>	<b>Lab. Practice ,Group-project , , feed-back learning</b>	<b>Assignment , Practical assessment (Lab Reporting &amp; Attitude) , assignment</b>
<b>d2.</b>	<b>Lab. Practice ,Group-project,</b>	<b>Practical assessment (Lab Attitude)</b>
<b>d3</b>	<b>Lab. Practice</b>	<b>Practical assessment (Lab Attitude)</b>
<b>d4</b>	<b>Lab. Practice, feed-back learning</b>	<b>Practical assessment (Lab Attitude) ,assignment</b>



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to physical pharmacy</b>	a1, a2, a3, b2	<ul style="list-style-type: none"> <li>Scope and purposes of physical pharmacy</li> <li>State of matters : factors affecting ( intermolecular forces, vapor pressure, atmospheric pressure, thermal energy)</li> <li>Circle of interconversion of a matter from a state of state ; name of processes, factors affecting</li> <li>Pharmaceutical Application of interconversion of matters in pharmacy</li> </ul>	2	4
2	<b>solid state physical properties</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>Melting points of solids</li> <li>Liquifiction of mixed solids</li> <li>Crystallization : principles and applications</li> <li>Amorphous and crystalline forms</li> <li>Polymorphism, hydrates, anhydrous</li> <li>Micrometrics : particle size definition, analysis</li> <li>Tapped and bulk density</li> <li>porosity, flowability and Carr`s index</li> <li>Mathematical problems related to the studied topics</li> <li>summary of Pharmaceutical Applications of solid state properties.</li> </ul>	3	6
	<b>liquid states physical properties</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>evaporation, boiling, vaporization and volatilization</li> <li>Viscosity and types of flow of fluids</li> <li>Mathematical problems related to the studied topics</li> <li>Pharmaceutical Applications of liquid state properties.</li> </ul>	2	4



MID-TERM EXAM				1	2
4	<b>Gas state physical properties</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>Ideal gases and Real gases</li> <li>Laws and equations of ideal and real gases</li> <li>Aerosols :principles and applications</li> </ul>	1	2
5	<b>Physical interactions between matters</b>	a1, a2, a3, b1, b2, b3, b4	<p>Principles, equations, factors and problems of the following physical matters interactions:</p> <ul style="list-style-type: none"> <li>solubility , miscibility and dissolution</li> <li>insolubility and immiscibility</li> <li>dispersion and surface tensions (Solid dispersion in liquids , Liquid dispersion in liquids)</li> <li>Sedimentation</li> <li>Colaescences</li> <li>partition coefficient: hydrophilicity and lipophilicity</li> <li>Adsorption</li> <li>Complexation</li> <li>Mathematical problems related to the studied topics</li> <li>Summary of pharmaceutical applications.</li> </ul>	3	6
6	<b>Stability and degradation kinetics</b>	a1, a2, a3, b1, b2, b3, b4	<ul style="list-style-type: none"> <li>Degradation of matters : definition and types of degradation, definition of stability, factors enhancing degradation, approaches to reduce or limit degradation</li> <li>Orders of degradarion (zero,first, second)</li> <li>Degradation parameters: degradation rate constant, half-life(<math>t_{1/2}</math>) , shelf life (<math>t_{90}</math>)</li> <li>Mathematical problems related to degradation order kinetics</li> </ul>	3	6
<b>Course Review</b>		a1, a2, a3, b1, b2, b3, b4	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2



<b>TOTAL</b>	16	32
<b>Number of Weeks /and Units Per Semester</b>	16 weeks	6 Units



B - Practical Aspect:				
Order	Tasks/ Experiments	Number of Weeks	contact hours	AlignedCourse Intended Learning Outcomes CILOs
1.	introduction to Lab.: safety requirements, list of experiments, How to report, etc + liquefaction of solids	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
2.	Tapped and bulk density porosity and Carr`s index of flowability description ..	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
3.	Crystallization phenomena	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
4.	Density of l liquids	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
5.	Viscosity determination	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
6.	Particle size determination (sedimentation method)	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
7.	Surface tension determination (Drop weight method)	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
8.	Solubility description	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
9.	Adsorption phenomenon	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
10.	Partition coefficient determination	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
11.	Review	1	2	c1, c2, c3, c4, d1, d2, d3, d4,
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, home-works, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with mathematical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b1,	4-13	3
2	<b>Group</b> : each group of students will be assigned to make a search-report supported by illustrating videos on one of the studied physical phenomenon.	c5, d1	14	2





## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2, b3, b4
2	Assignments (1 + 2)	4-13 , 14	5	5	b1, c5, d1,
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b1, b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, b1, b2, b3, b4
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2, b3, b4
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	c1, c2, c3, c4, d1, d2, d3, d4,
2	Lab. Attitude	weekly	2.5	2.5	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5	c1, c2
4	Lab. Reporting	weekly	2.5	2.5	c5, d1
5	Exam of practice theory (written exam or oral exam)	14	5	5	c1, c2, c3, c4, d1, d2, d3, d4,
6	Practical exam (practical)	14	20	20	c1, c2, c3, c4, d1, d2, d3, d4,
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Martin`s : Physical pharmacy and pharmaceutical sciences, 2011, Lippincott Williams & Wilkins, UK

### 2- Essential References.

1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
2. Subrahmanyam. A text book of physical pharmaceutics, 2015, VallabhPrakashan, India
3. R.S. Gaud G.T. Gupta practical physical pharmacy, 2012, CBS, USA

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### HUMAN HISTOLOGY

I. Course Identification and General Information:							
1.	Course Title:	HUMAN Histology					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( 2nd ) Year – (2nd) semester					
5.	Pre –requisite (if any):	• General biology					
6.	Co –requisite (if any):	• Physiology I , Anatomy					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course focuses on the components of the main anatomical structure of the human body and its systems and organs.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Discuss the distribution of tissues in human body.
2.		a2. Identify the different types of tissues in human body .
3.		a3. Determine the units of building of human tissues.
4.	A2	a4. Explain the biological role of endogenous substances participating in structures of human tissues .
5.	B2	b1. Classify the tissues based on histological basis.
6.		b2. Compare histologically between tissues of human body.
7.	B3	b3 .Relate the functions of body tissues to their anatomical features.
8.	C1	c1.Handle efficiently the tools and chemicals used in basic medical sciences Lab.
9.		c2. Operate successfully the instruments used in basic medical sciences Lab.
10.	C2	c3 . Perform effectively titrimetric analysis of materials using standard procedures and avoiding the source of errors.
11.	C3	c4 .Take the required safety criteria during performing practical works in basic medical sciences Lab..
12.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
13.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Work successfully in team-work.
15.	D2	d2. Show respect to life & behave in discipline during practicing practical works.
16.	D3	d3. Communicate effectively with colleagues
17.	D4	d4. Demonstrate the ability of time management and self-learning during performing practical works and assignments.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture,, laboratory practice	written exam , , assignment
a4	Lecture, feed-back learning	written exam , assignment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, , feed-back learning	written exam , quizzes
b3	Lecture, feed-back learning	written exam, quizzes
b6	Lecture	written exam

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	Lab. Practice, Feed-back learning ,Group-project.	assignment

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3, d4	Lab. Practice, Group-project ,, feed-back learning	Assignment



## IV. Course Content:

### A.Theoretical part

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b2, b3	histology definition, purposes, brief history, techniques used in study of human tissues, classification of tissues.	1	2
2	<b>Epithelium tissue</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure , characteristics , classification, function</li> <li>Distribution in body</li> </ul>	3	6
3	<b>Connective tissue</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure , characteristics , classification, function</li> <li>Distribution in body</li> </ul>	3	6
	<ul style="list-style-type: none"> <li>Midterm exam</li> </ul>			1	2
4	<b>Muscular tissue</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure , characteristics , classification, function</li> <li>Distribution in body</li> </ul>	3	6
5	<b>Nervous tissue</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure , characteristics , classification, function</li> <li>Distribution in body</li> </ul>	3	6
FINAL - EXAM				1	2
TOTAL				15	30
Number of Weeks /and Units Per Semester				16 weeks	5 Units



<b>B - Practical part :</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	sampling & preparation of human tissues for investigation	1	2	c1, c2, c3, c4, d1, d2, d3, d4
2	Epithelial tissues	2	4	c1, c2, c3, c4, d1, d2, d3, d4
3	connective tissues	2	6	c1, c2, c3, c4, d1, d2, d3, d4
4	muscular tissues	2	6	c1, c2, c3, c4, d1, d2, d3, d4
5	nervous tissues	2	6	c1, c2, c3, c4, d1, d2, d3, d4
	practical exam	1	2	
<b>Number of Weeks /and Units Per Semester</b>		<b>10</b>	<b>20</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>





## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
2	<b>Group</b> : each group of students will be assigned to do a summary report on one of the body tissues associated with hand drawings .	a4, c1	14	10

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b2, b3, b6, c1, d1, d2
2	Assignments (1 + 2)	4, 14	10	10	a3, a4, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b2, b3, b6, c1, d1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b2, b3, b6, c1, d1, d2
TOTAL			100	100 %	100



## VIII. Learning Resources:

1- Required Textbook(s)	
	1. Tortora, G.J. (2006). Introduction to the human body. Harper and Row Publisher, New York.
2- Essential References.	
	1. Alexander P. (2008). Human anatomy and physiology. Benjamin/Cummings Pub. California.
3- Electronic Materials and Web Sites etc.	
	1. Http: // www.google. Com 2. Http:// www.yahoo.com

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of HISTOLOGY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course focuses on the components of the main anatomical structure of the human body and its systems and organs.</p>



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Discuss the distribution of tissues in human body.
2.		a2. Identify the different types of tissues in human body .
3.		a3. Determine the units of building of human tissues.
4.	A2	a4. Explain the biological role of endogenous substances participating in structures of human tissues .
5.	B2	b1. Classify the tissues based on histological basis.
6.		b2. Compare histologically between tissues of human body.
7.	B3	b3 .Relate the functions of body tissues to their anatomical features.
8.	C1	c1.Handle efficiently the tools and chemicals used in basic medical sciences Lab.
9.		c2. Operate successfully the instruments used in basic medical sciences Lab.
10.	C2	c3 . Perform effectively titrimetric analysis of materials using standard procedures and avoiding the source of errors.
11.	C3	c4 .Take the required safety criteria during performing practical works in basic medical sciences Lab..
12.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
13.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Work successfully in team-work.
15.	D2	d2. Show respect to life & behave in discipline during practicing practical works.
16.	D3	d3. Communicate effectively with colleagues
17.	D4	d4. Demonstrate the ability of time management and self-learning during performing practical works and assignments.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture,, laboratory practice	written exam , , assignment
a4	Lecture, feed-back learning	written exam , assignment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, , feed-back learning	written exam , quizzes
b3	Lecture, feed-back learning	written exam, quizzes
b6	Lecture	written exam

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	Lab. Practice, Feed-back learning ,Group-project.	assignment

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3, d4	Lab. Practice, Group-project ,, feed-back learning	Assignment



## IV. Course Content:

### A.Theoretical part

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b2, b3	histology definition, purposes, brief history, techniques used in study of human tissues, classification of tissues.	1	2
2	<b>Epithelium tissue</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure , characteristics , classification, function</li> <li>Distribution in body</li> </ul>	3	6
3	<b>Connective tissue</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure , characteristics , classification, function</li> <li>Distribution in body</li> </ul>	3	6
	<ul style="list-style-type: none"> <li>Midterm exam</li> </ul>			1	2
4	<b>Muscular tissue</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure , characteristics , classification, function</li> <li>Distribution in body</li> </ul>	3	6
5	<b>Nervous tissue</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure , characteristics , classification, function</li> <li>Distribution in body</li> </ul>	3	6
FINAL - EXAM				1	2
TOTAL				15	30
Number of Weeks /and Units Per Semester				16 weeks	5 Units



<b>B - Practical part :</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	sampling & preparation of human tissues for investigation	1		c1, c2, c3, c4, d1, d2, d3, d4
2	Epithelial tissues	2	4	c1, c2, c3, c4, d1, d2, d3, d4
3	connective tissues	2	6	c1, c2, c3, c4, d1, d2, d3, d4
4	muscular tissues	2	6	c1, c2, c3, c4, d1, d2, d3, d4
5	nervous tissues	2	6	c1, c2, c3, c4, d1, d2, d3, d4
	practical exam	1	2	
<b>Number of Weeks /and Units Per Semester</b>		<b>10</b>	<b>20</b>	

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills





## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
2	<b>Group</b> : each group of students will be assigned to do a summary report on one of the body tissues associated with hand drawings .	a4, c1	14	10

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b2, b3, b6, c1, d1, d2
2	Assignments (1 + 2)	4, 14	10	10	a3, a4, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b2, b3, b6, c1, d1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b2, b3, b6, c1, d1, d2
TOTAL			100	100 %	100



## VIII. Learning Resources:

1- Required Textbook(s)	
	2. Tortora, G.J. (2006). Introduction to the human body. Harper and Row Publisher, New York.
2- Essential References.	
	2. Alexander P. (2008). Human anatomy and physiology. Benjamin/Cummings Pub. California.
3- Electronic Materials and Web Sites etc.	
	3. <a href="http://www.google.com">Http: // www.google. Com</a>
	4. <a href="http://www.yahoo.com">Http:// www.yahoo.com</a>

## IX. Course Policies:

5.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
6.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
7.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
8.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### HUMAN ANATOMY

I. Course Identification and General Information:							
1.	Course Title:	HUMAN ANATOMY					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( 2nd ) Year – ( FIRST ) semester					
5.	Pre –requisite (if any):	• General biology					
6.	Co –requisite (if any):	• Physiology I , Histology					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course focuses on the components of the main anatomical structure of the human body and its systems and organs.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Discuss the anatomical organization of human body.
2.		a2. Identify the different systems and organs of human body .
3.		a3. Determine the units of building of human body.
4.	A2	a4. Explain the biological role of endogenous substances participating in structures of human body .
5.	B2	b1. Classify the body into systems and organs based on anatomical basis.
6.	B3	b2. Compare anatomically between body systems.
7.		b3 .Relate the functions of body organs to their anatomical features.
8.	C1	c1.Handle efficiently the tools and chemicals used in basic medical sciences Lab.
9.		c2. Operate successfully the instruments used in basic medical sciences Lab.
10.	C2	c3 . Perform effectively titrimetric analysis of materials using standard procedures and avoiding the source of errors.
11.	C3	c4 .Take the required safety criteria during performing practical works in basic medical sciences Lab..
12.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
13.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Work successfully in team-work.
15.	D2	d2. Show respect to life & behave in discipline during practicing practical works.
16.	D3	d3. Communicate effectively with colleagues
17.	D4	d4. Demonstrate the ability of time management and self-learning during performing practical works and assignments.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture,, laboratory practice	written exam , , assignment
a4	Lecture, feed-back learning	written exam , assignment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, , feed-back learning	written exam , quizzes
b3	Lecture, feed-back learning	written exam, quizzes
b6	Lecture	written exam

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	Lab. Practice, Feed-back learning ,Group-project.	assignment

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3, d4	Lab. Practice, Group-project ,, feed-back learning	Assignment



## IV. Course Content:

### A.Theoretical part

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b2, b3	anatomy definition, purposes, brief history, anatomical positions, general rules.	1	2
2	<b>The Nervous system</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure , organs &amp; classification of nervous system (central, peripheral : sympathetic, parasympathetic)</li> <li>Anatomical features of neuron , ganglia, neural nodes, brain, spinal cord</li> </ul>	3	6
3	<b>Skeletomuscular system</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure, organs</li> <li>Anatomical features of bones, joints, muscles</li> </ul>	3	6
	<ul style="list-style-type: none"> <li>Midterm exam</li> </ul>			1	2
4	<b>Circulatory and lymphatic systems</b>	a3, a4, b2, b3, b6,d1, d2	<p>Circulatory system</p> <ul style="list-style-type: none"> <li>Structure, organs</li> <li>Components of blood</li> <li>Anatomical features of blood vessels (arteries, veins, capillaries),</li> <li>Blood supply to body organs</li> <li>Anatomical features of heart and its connection to lung and general circulation</li> </ul> <p>lymphatic system : structure, organs and anatomical features.</p>	2	4
5	<b>Respiratory system</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure, classification (upper lower) , organs</li> <li>Anatomical features of nose, larynx, trachea, bronchi, lungs</li> </ul>	1	2



6	<b>Alimentary system and accessories</b>	a3, a4, b2, b3, b6, d1, d2	<ul style="list-style-type: none"> <li>Structure, organs</li> <li>Anatomical features of mouth, pharynx, esophagus, stomach, small and large intestine, liver &amp; gall bladder, pancreas, spleen</li> </ul>	2	4
7	<b>Urinary system</b>	a3, a4, b2, b3, b6, d1, d2	<ul style="list-style-type: none"> <li>Structure, organs</li> <li>Anatomical features of kidneys, urethra, urinary bladder</li> </ul>	1	2
8	<b>Reproductive system</b>	a3, a4, b2, b3, b6, d1, d2	<ul style="list-style-type: none"> <li>Structure, organs &amp; Anatomical features of female reproductive system</li> <li>Structure, organs &amp; Anatomical features of female reproductive system</li> </ul>	1	2
9	<b>Endocrine system</b>	a3, a4, b2, b3, b6, d1, d2	<ul style="list-style-type: none"> <li>Structure, classification of endocrine glands</li> <li>Anatomical features of pituitary, thyroid, pancreas, adrenal and gonads</li> </ul>	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	9 Units





B - Practical part :				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Upper extremity including surface Anatomy	2	4	c1, c2, c3, c4, d1, d2, d3, d4
2	Lower extremity including surface Anatomy	3	6	c1, c2, c3, c4, d1, d2, d3, d4
3	Head & Spinal cord and Neck and Brain including surface Anatomy	3	6	c1, c2, c3, c4, d1, d2, d3, d4
4	Thorax including surface anatomy, abdominal muscles , joints	3	6	c1, c2, c3, c4, d1, d2, d3, d4
	practical exam	1	2	
Number of Weeks /and Units Per Semester		12	24	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
2	<b>Group</b> : each group of students will be assigned to do a summary report on one of the body system associated with hand drawings .	a4, c1	14	10

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b2, b3, b6, c1, d1, d2
2	Assignments (1 + 2)	4, 14	10	10	a3, a4, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b2, b3, b6, c1, d1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b2, b3, b6, c1, d1, d2
TOTAL			100	100 %	100



## VIII. Learning Resources:

1- Required Textbook(s)	
	<ol style="list-style-type: none"> <li>1. Cohen (2009). Memmler's Structure &amp; Function of Human Body, LWW.</li> <li>2. Tortora, G.J. (2006). Introduction to the human body. Harper and Row Publisher, New York.</li> </ol>
2- Essential References.	
	<ol style="list-style-type: none"> <li>1. Alexander P. (2008). Human anatomy and physiology. Benjamin/Cummings Pub. California.</li> <li>2. Waugh(2008). Ross &amp; Wilson Anatomy &amp; Physiology, Elsevier.</li> </ol>
3- Electronic Materials and Web Sites etc.	
	<ol style="list-style-type: none"> <li>1. Http: // www.google. Com</li> <li>2. Http:// www.yahoo.com</li> </ol>

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of HUMAN ANATOMY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

III. Course Description:
The course focuses on the components of the main anatomical structure of the human body and its systems and organs.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 3. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Discuss the anatomical organization of human body.
2.		a2. Identify the different systems and organs of human body .
3.		a3. Determine the units of building of human body.
4.	A2	a4. Explain the biological role of endogenous substances participating in structures of human body .
5.	B2	b1. Classify the body into systems and organs based on anatomical basis.
6.	B3	b2. Compare anatomically between body systems.
7.		b3 .Relate the functions of body organs to their anatomical features.
8.	C1	c1.Handle efficiently the tools and chemicals used in basic medical sciences Lab.
9.		c2. Operate successfully the instruments used in basic medical sciences Lab.
10.	C2	c3 . Perform effectively titrimetric analysis of materials using standard procedures and avoiding the source of errors.
11.	C3	c4 .Take the required safety criteria during performing practical works in basic medical sciences Lab..
12.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
13.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Work successfully in team-work.
15.	D2	d2. Show respect to life & behave in discipline during practicing practical works.
16.	D3	d3. Communicate effectively with colleagues
17.	D4	d4. Demonstrate the ability of time management and self-learning during performing practical works and assignments.



## 1. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture,, laboratory practice	written exam , , assignment
a4	Lecture, feed-back learning	written exam , assignment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, , feed-back learning	written exam , quizzes
b3	Lecture, feed-back learning	written exam, quizzes
b6	Lecture	written exam

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	Lab. Practice, Feed-back learning ,Group-project.	assignment

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3, d4	Lab. Practice, Group-project ,, feed-back learning	Assignment



## IV. Course Content:

### A.Theoretical part

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b2, b3	anatomy definition, purposes, brief history, anatomical positions, general rules.	1	2
2	<b>The Nervous system</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure , organs &amp; classification of nervous system (central, peripheral : sympathetic, parasympathetic)</li> <li>Anatomical features of neuron , ganglia, neural nodes, brain, spinal cord</li> </ul>	3	6
3	<b>Skeletomuscular system</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure, organs</li> <li>Anatomical features of bones, joints, muscles</li> </ul>	3	6
	<ul style="list-style-type: none"> <li>Midterm exam</li> </ul>			1	2
4	<b>Blood &amp; Cardiovascular system</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure, organs,</li> <li>Components of blood</li> <li>Anatomical features of blood vessels (arteries, veins, capillaries),</li> <li>Blood supply to body organs</li> <li>Anatomical features of heart and its connection to lung and general circulation</li> </ul>	2	4
5	<b>Respiratory system</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure, classification (upper lower) , organs</li> <li>Anatomical features of nose, larynx, trachea, bronchi, lungs</li> </ul>	1	2
6	<b>Alimentary system and accessories</b>	a3, a4, b2, b3, b6,d1, d2	<ul style="list-style-type: none"> <li>Structure, organs</li> <li>Anatomical features of mouth, pharynx, esophagus, stomach, small and large intestine , liver &amp; gall bladder, pancreas, spleen</li> </ul>	2	4





7	<b>Urinary system</b>	a3, a4, b2, b3, b6, d1, d2	<ul style="list-style-type: none"> <li>Structure, organs</li> <li>Anatomical features of kidneys, urethra, urinary bladder</li> </ul>	1	2
8	<b>Reproductive system</b>	a3, a4, b2, b3, b6, d1, d2	<ul style="list-style-type: none"> <li>Structure, organs &amp; Anatomical features of female reproductive system</li> <li>Structure, organs &amp; Anatomical features of female reproductive system</li> </ul>	1	2
9	<b>Endocrine system</b>	a3, a4, b2, b3, b6, d1, d2	<ul style="list-style-type: none"> <li>Structure, classification of endocrine glands</li> <li>Anatomical features of pituitary, thyroid, pancreas, adrenal and gonads</li> </ul>	1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	9 Units



<b>B - Practical part :</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Upper extremity including surface Anatomy	2	4	c1, c2, c3, c4, d1, d2, d3, d4
2	Lower extremity including surface Anatomy	3	6	c1, c2, c3, c4, d1, d2, d3, d4
3	Head & Spinal cord and Neck and Brain including surface Anatomy	3	6	c1, c2, c3, c4, d1, d2, d3, d4
4	Thorax including surface anatomy, abdominal muscles , joints	3	6	c1, c2, c3, c4, d1, d2, d3, d4
	practical exam	1	2	
<b>Number of Weeks /and Units Per Semester</b>		<b>12</b>	<b>24</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
2	<b>Group</b> : each group of students will be assigned to do a summary report on one of the body system associated with hand drawings .	a4, c1	14	10

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b2, b3, b6, c1, d1, d2
2	Assignments (1 + 2)	4, 14	10	10	a3, a4, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b2, b3, b6, c1, d1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b2, b3, b6, c1, d1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s)



	1. Cohen (2009). Memmler's Structure & Function of Human Body, LWW.
	2. Tortora, G.J. (2006). Introduction to the human body. Harper and Row Publisher, New York.
<b>2- Essential References.</b>	
	1. Alexander P. (2008). Human anatomy and physiology. Benjamin/Cummings Pub. California.
	2. Waugh(2008). Ross & Wilson Anatomy & Physiology, Elsevier.
<b>3- Electronic Materials and Web Sites etc.</b>	
	1. Http: // www.google. Com
	2. Http:// www.yahoo.com

<b>IX.Course Policies:</b>	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### Pharmaceutical Biochemistry I

I. Course Identification and General Information:							
1.	Course Title:	Pharmaceutical Biochemistry I					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( 2nd ) Year – (2nd) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"><li>• General chemistry</li><li>• General biology</li></ul>					
6.	Co –requisite (if any):	-----					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals study of the types of biochemical compounds, including carbohydrates, lipids, proteins and the changes to which are undergone to in the body.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the biochemical compounds and that have significant roles in human and living organisms bodies.
2.	A2	a2. Explicit the physiological/pathological involvement of carbohydrates, lipids, proteins.
3.	A3	a3. Discuss the biosynthesis and metabolic pathways of biochemical compounds.
4.	B1	b1. Interpret certain body diseases based on disturbances in levels of body biochemicals
5.	B2	b2 . Solve biochemical problems related to nomenclature, synthetic and metabolic reactions.
6.		b3. Classify biochemicals into various categories.
7.		b4. Compare between different types of biochemical synthesis or metabolic reactions based on their income and outcomes products.
8.	B3	b5. Predict the outcomes of biochemical reactions.
9.	C1	c1.Handleefficiently the tools and chemicals used in biochemistry Lab.
10.		c2. Operate successfully the instruments used in biochemistry Lab.
11.	C2	c3 . Perform efficiently experiments and practical tasks for in vitro and in vivo identifications of biochemical compounds using standard procedures.
12.		c4. Take and prepare human samples to biochemistry investigations using standard procedures.
13.	C3	c5 .Take the required safety criteria during performing practical works in in biochemistry Lab.
14.	C4	c6 .Appropriately search for information and also present and report his/her work using various source of information and media technologies..
15.		c7. Use effectively symbols and figures and drawing to express chemical reactions and synthesis
16.	D1	d1. Work successfully in team-work.
17.	D2	d2. Show respect to life & behave in discipline during performing practical works in biochemistry Lab.



18.	D3	d3. Communicate effectively with his/her colleagues during performing practical works in in biochemistry Lab.
19.	D4	d4. Demonstrate time management and problem solving skills.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	written exam , Practical assessment
a2	Lecture,, feed-back learning	written exam , assignment
a3	Lecture, feed-back learning, Group-project.	written exam , assignment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	lecture, group-project, feed-back learning	Written exam, assignments
b2 , b3, b4	Lecture, , feed-back learning	written exam , quizzes
b5	Lecture,, feed-back learning	written exam, quizzes

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment
c3, c4	Lab. Practice	Practical assessment
c5	Lab. Practice	Practical assessment
c6, c7	Group-project, feed-back learning	Written- exam , practical assessment , assignments





**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project , feed-back learning	Assignment , Practical assessment
d2	lecture	Written exam
d3.	Lab. Practice	Practical assessment
d4	Lab. Practice	Practical assessment (Lab Attitude)
	Lab. Practice , Group-project	Practical assessment , assignment



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Carbohydrates</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Glycolysis</li> <li>Citric acid cycle</li> <li>Glycogenesis and glycogenolysis</li> <li>Hexose monophosphate shunt</li> <li>Uronic acid pathway</li> <li>Blood sugar and its regulation.</li> <li>Pathological conditions related carbohydrates.</li> </ul>	4	6
2	<b>Lipids (1)</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Biosynthesis of fats</li> <li>Oxidation of fatty acids</li> <li>Ketogenesis and ketosis</li> <li>Metabolism of cholesterol</li> <li>Essential fatty acid and eicosanodis phospholipids.</li> <li>Sphingolipids.</li> <li>Bile salts</li> <li>Pathological conditions related to lipids.</li> </ul>	2	4
<b>MID-TERM EXAM</b>				1	2
	<b>Lipids (2)</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Biosynthesis of fats</li> <li>Oxidation of fatty acids</li> <li>Ketogenesis and ketosis</li> <li>Metabolism of cholesterol</li> <li>Essential fatty acid and eicosanodis phospholipids.</li> <li>Sphingolipids.</li> <li>Bile salts</li> <li>Pathological conditions related to lipids.</li> </ul>	2	4
3	<b>Proteins</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classification of aminoacides</li> <li>General biochemical reaction of amino acids like</li> <li>Transamination</li> </ul>	5	10



			<ul style="list-style-type: none"> <li>• Deamination</li> <li>• Decarboxylation</li> <li>• Peptides and polypeptides</li> <li>• Biosynthesis of proteins : role of DNA</li> <li>• Classifications and physiological roles of proteins</li> <li>• Metabolism of proteins</li> <li>• Urea cycle</li> <li>• Nitrogen balance</li> <li>• Pathological conditions related to proteins.</li> </ul>		4
<b>Course Review</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	Review of the course topics by discussion session.	1		2
<b>FINAL - EXAM</b>			1		2
<b>TOTAL</b>			16		32
<b>Number of Weeks /and Units Per Semester</b>			16 weeks		7 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	<b>introduction to biochemistry chemistry Lab.:</b> safety requirements, list of experiments, How to report, etc	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
2.	<b>carbohydrates</b> monosaccharaides : physicochemical properties and in vitro identification & differentiation.	2	4	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
3.	<b>carbohydrates</b> disaccharides physicochemical properties and in vitro identification & differentiation.	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
4.	<b>carbohydrates</b> polysaccharides physicochemical properties and in vitro identification & differentiation.	2	4	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
5.	<b>Sampling and preserving of human samples :</b> blood, urine	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3,



				d4,
6.	<b>Bioassay of blood glucose</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
7.	<b>Lipids</b> physicochemical properties and in vitro identification of cholesterol.	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
8.	<b>Assay of cholesterol in human blood.</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
9.	<b>Proteins:</b> physicochemical properties and in vitro identification of certain types of proteins	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
PRACTICAL EXAM		1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
<b>Total</b>		12	24 equivalent to 12 credit hours	
<b>Number of Weeks</b>			12	

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.  
The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> the teacher provide the students with biochemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b2, c5, d4	4-13	3
2	<b>Group :</b> each group of students will be assigned to present a search report on one pathological condition related to disturbances in biochemical levels in the body.	b1, d1, , c6	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b1, b2, c5, c6, d1, d4,
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b5
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
TOTAL			60	60 %	60



Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
2	Lab. Attitude	weekly	2.5	2.5	d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5	c6, c7
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
6	Practical exam (practical)	14	20	20	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Pamela C. Champe, Lippincott's illustrated review in Biochemistry, 2010, Lippincott William & Wilkins

### 2- Essential References.

1. Hiram f. Gilbert , Basic concepts in biochemistry ; a student's survival guide, 2000, McGraw-Hill
2. Vyas . Pharmaceutical biochemistry

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.



4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.





## Course Plan (Syllabus) of medical biochemistry I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

III. Course Description:
The course deals study of the types of biochemical compounds, including carbohydrates, lipids, proteins and the changes to which are undergone to in the body.

III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies		
3. Alignment CILOs to PILOs		
No.	PILOs	CILOs
20.	A1	a1. Identify the biochemical compounds and that have significant roles in human and living organisms bodies.



21.	A2	a2. Explicit the physiological/pathological involvement of carbohydrates, lipids, proteins.
22.	A3	a3. Discuss the biosynthesis and metabolic pathways of biochemical compounds.
23.	B1	b1. Interpret certain body diseases based on disturbances in levels of body biochemicals
24.	B2	b2 . Solve biochemical problems related to nomenclature, synthetic and metabolic reactions.
25.		b3. Classify biochemicals into various categories.
26.		b4. Compare between different types of biochemical synthesis or metabolic reactions based on their income and outcomes products.
27.	B3	b5. Predict the outcomes of biochemical reactions.
28.	C1	c1.Handleefficiently the tools and chemicals used in biochemistry Lab.
29.		c2. Operate successfully the instruments used in biochemistry Lab.
30.	C2	c3 . Perform efficiently experiments and practical tasks for in vitro and in vivo identifications of biochemical compounds using standard procedures.
31.		c4. Take and prepare human samples to biochemistry investigations using standard procedures.
32.	C3	c5 .Take the required safety criteria during performing practical works in in biochemistry Lab.
33.	C4	c6 .Appropriately search for information and also present and report his/her work using various source of information and media technologies..
34.		c7. Use effectively symbols and figures and drawing to express chemical reactions and synthesis
35.	D1	d1. Work successfully in team-work.
36.	D2	d2. Show respect to life & behave in discipline during performing practical works in biochemistry Lab.
37.	D3	d3. Communicate effectively with his/her colleagues during performing practical works in in biochemistry Lab.
38.	D4	d4. Demonstrate time management and problem solving skills.



## 1. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	written exam , Practical assessment
a2	Lecture,, feed-back learning	written exam , assignment
a3	Lecture, feed-back learning, Group-project.	written exam , assignment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	lecture, group-project, feed-back learning	Written exam, assignments
b2 , b3, b4	Lecture, , feed-back learning	written exam , quizzes
b5	Lecture,, feed-back learning	written exam, quizzes

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment
c3, c4	Lab. Practice	Practical assessment
c5	Lab. Practice	Practical assessment
c6, c7	Group-project, feed-back learning	Written- exam , practical assessment , assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project , feed-back learning	Assignment , Practical



		assessment
d2	lecture	Written exam
d3.	Lab. Practice	Practical assessment
d4	Lab. Practice	Practical assessment (Lab Attitude)
	Lab. Practice , Group-project	Practical assessment , assignment

#### IV. Course Content:

##### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
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1	<b>Carbohydrates</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Glycolysis</li> <li>Citric acid cycle</li> <li>Glycogenesis and glycogenolysis</li> <li>Hexose monophosphate shunt</li> <li>Uronic acid pathway</li> <li>Blood sugar and its regulation.</li> <li>Pathological conditions related carbohydrates.</li> </ul>	4	6
2	<b>Lipids (1)</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Biosynthesis of fats</li> <li>Oxidation of fatty acids</li> <li>Ketogenesis and ketosis</li> <li>Metabolism of cholesterol</li> <li>Essential fatty acid and eicosanodis phospholipids.</li> <li>Sphingolipids.</li> <li>Bile salts</li> <li>Pathological conditions related to lipids.</li> </ul>	2	4
<b>MID-TERM EXAM</b>				1	2
	<b>Lipids (2)</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Biosynthesis of fats</li> <li>Oxidation of fatty acids</li> <li>Ketogenesis and ketosis</li> <li>Metabolism of cholesterol</li> <li>Essential fatty acid and eicosanodis phospholipids.</li> <li>Sphingolipids.</li> <li>Bile salts</li> <li>Pathological conditions related to lipids.</li> </ul>	2	4
3	<b>Proteins</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classification of aminoacides</li> <li>General biochemical reaction of amino acids like</li> <li>Transamination</li> <li>Deamination</li> <li>Decarboxylation</li> <li>Peptides and polypeptides</li> <li>Biosynthesis of proteins : role of DNA</li> <li>Classifications and physiological roles of proteins</li> </ul>	5	10 4



			<ul style="list-style-type: none"> <li>Metabolism of proteins</li> <li>Urea cycle</li> <li>Nitrogen balance</li> <li>Pathological conditions related to proteins.</li> </ul>		
Course Review	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	Review of the course topics by discussion session.		1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	7 Units

B - Practical Aspect:				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs



10.	<b>introduction to biochemistry chemistry Lab.:</b> <b>safety requirements, list of experiments, How to report, etc</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
11.	<b>carbohydrates</b> monosaccharaides : physicochemical properties and in vitro identification & differentiation.	2	4	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
12.	<b>carbohydrates</b> disaccharides physicochemical properties and in vitro identification & differentiation.	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
13.	<b>carbohydrates</b> polysaccharides physicochemical properties and in vitro identification & differentiation.	2	4	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
14.	<b>Sampling and preserving of human samples :</b> <b>blood, urine</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
15.	<b>Bioassay of blood glucose</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
16.	<b>Lipids</b> physicochemical properties and in vitro identification of cholesterol.	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
17.	<b>Assay of cholesterol in human blood.</b>	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
18.	<b>Proteins:</b> physicochemical properties and in vitro identification of certain types of proteins	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
PRACTICAL EXAM		1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
<b>Total</b>		12	24 equivalent to 12 credit hours	
<b>Number of Weeks</b>			12	





## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with biochemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b2, c5, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to present a search report on one pathological condition related to disturbances in biochemical levels in the body.	b1, d1, , c6	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment



No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b1, b2, c5, c6, d1, d4,
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b5
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
2	Lab. Attitude	weekly	2.5	2.5	d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5	c6, c7
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
6	Practical exam (practical)	14	20	20	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Pamela C. Champe, Lippincott's illustrated review in Biochemistry, 2010, Lippincott William & Wilkins



## 2- Essential References.

1. Hiram f. Gilbert , Basic concepts in biochemistry ; a student's survival guide, 2000, McGraw-Hill
2. Vyas . Pharmaceutical biochemistry

## 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



<b>XIII. Course Identification and General Information:</b>					
1	Course Title:	Parasitology			
2	Course Number & Code:				
3	Credit hours:	C.H			
		Th.	Pr.	Tr.	Seminar.
		1	2		
4	Study level/ semester at which this course is offered:	( SECOND ) YEAR – ( FIRST ) SEMESTER			
5	Prerequisite:	None			
	Co-requisite:	None			
7	Program (s) in which the course is offered:	BS.cPharmacy			
8	Language of teaching the course:	English			
9	Location of teaching the course:				
10	Prepared by:	collage			
11	Date of approval:				

<b>XIV. Course Description:</b>
<p>This course provides undergraduate pharmacy students with the essential knowledge and understanding about different types of parasites prevalent in Yemen and the parasitic diseases caused by them. It focuses on the epidemiology, morphologic and infective stages, life cycle, mode(s) of transmission, pathogenesis and clinical features, diagnosis, treatment as well as prevention and control of medically important protozoa and helminths.</p>

<b>XVI. Intended learning outcomes (ILOs) of the course</b>			
<b>(A) Knowledge and Understanding:</b>			
Alignment of Course-Intended Learning Outcomes (CILOs) to Program-Intended Learning Outcomes (PILOs) in Knowledge and Understanding.			
PILOs in knowledge and understanding		CILOs in knowledge and understanding	
After completing this program, students would be able to:		After participating in the course, students would be able to:	
A1-	Demonstrate essential knowledge and understanding of medical parasitology within the context of pharmacy profession.	a1-	Define major concepts and outline medically important parasites and the diseases caused by them.
A2-	Demonstrate sufficient understanding of the epidemiology, life cycle, infective stages, hosts, mode(s) of transmission, pathogenesis and clinical features, diagnosis, drug and	a2-	Describe the distribution, epidemiology, morphology, life cycle, infective stages, hosts, mode(s) of transmission, pathogenesis and clinical features, diagnosis, best





Alignment of learning outcomes of knowledge and understanding to teaching and assessment methods:			
CILOs in Knowledge and Understanding		Teaching strategies/methods	Methods of assessment
After participating in the course, students would be able to:		<ul style="list-style-type: none"><li>• Lecture presentations</li><li>• Tutorials</li><li>• Discussion-oriented lectures</li></ul>	<ul style="list-style-type: none"><li>• Quizzes</li><li>• Mid-semester and final exams (MCQs, short-answer and essay questions)</li></ul>
a1-	Define major concepts and outline medically important parasites and the diseases caused by them.		
a2-	Describe the distribution, epidemiology, morphology, life cycle, infective stages, hosts, mode(s) of transmission, pathogenesis and clinical features, diagnosis, best therapeutic approaches and prevention and control of medically important parasites.		
a3-	Recognize the role of animals and/or vectors in the transmission and epidemiology of zoonotic parasitic infections and the impact of parasitic zoonoses on human health.		

## (B) Intellectual Skills

Alignment of Course CILOs to PILOs in intellectual skills:

PILOs in intellectual skills		CILOs of intellectual skills	
After completing this program, students would be able to:		After participating in the course, students would be able to:	
B1-	Integrate the basic knowledge and understating of medical parasitology with those of other related medical fields, with emphasis on treatment options.	b1-	Critically analyze and propose solutions for health problems imposed by parasites in Yemen based on the knowledge and understanding of medical parasitology.
B2-	Appraise the problem of parasitic infections prevalent in Yemen, and suggest cost-effective approaches to address them.	b2-	Propose the best cost-effective therapeutic and control approaches for parasitic diseases prevalent in Yemen.

## Teaching and Assessment Methods for Achieving Learning Outcomes

Alignment of learning outcomes of intellectual skills to teaching methods and assessment methods:

CILOs in intellectual skills	Teaching strategies/methods	Methods of assessment
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After participating in the course, students would be able to:			
b1-	Critically analyze and propose solutions for health problems imposed by parasites in Yemen based on the knowledge and understanding of medical parasitology.	<ul style="list-style-type: none"> <li>Interactive teaching: brainstorming, etc.</li> <li>Seminars</li> <li>Oral presentations</li> </ul>	<ul style="list-style-type: none"> <li>Coursework assignments</li> <li>Oral exams</li> </ul>
b2-	Propose the best cost-effective therapeutic and control approaches for parasitic diseases prevalent in Yemen.		

### (C) Professional and Practical Skills

Alignment of CILOs to PILOs in professional and practical skills

PILOs in professional and practical skills		CILOs in professional and practical skills	
After completing this program, students would be able to:		After participating in the course, students would be able to:	
C1-	Properly use and maintain the light microscope and follow health and safety precautions in the laboratory.	c1-	Apply rules and guidelines related to safety precautions in the laboratory to work in a risk-free environment.
C2-	Identify diagnostic stages to be able to serve remote rural communities where laboratory services are unavailable.	c2-	Identify parasite stages under the light microscope.

### Teaching and Assessment Methods for Achieving Learning Outcomes

Alignment of learning outcomes of professional and practical skills to teaching and assessment methods:

CILOs in professional and practical skills		Teaching strategies/methods	Methods of assessment
After participating in the course, students would be able to:			
c1-	Apply rules and guidelines related to safety precautions in the laboratory to work in a risk-free environment.	<ul style="list-style-type: none"> <li>Laboratory demonstrations</li> <li>Laboratory practice</li> <li>Group discussion</li> <li>Animations and videos</li> </ul>	<ul style="list-style-type: none"> <li>Practical quizzes</li> <li>Portfolios</li> <li>Logbooks and reports</li> <li>Mid-semester and final exams</li> </ul>
c2-	Identify parasite stages under the light microscope.		





(D) General and Transferable Skills			
Alignment of course intended-learning outcomes (CILOs) to program-intended learning outcomes (PILOs) in general and transferable skills			
PILOs in general and transferable skills		CILOs in general and transferable skills	
After completing this program, students would be able to:		After participating in the course, students would be able to:	
D1-	Use computers and technology efficiently to collect, analyze and interpret information in the learning process.	d1-	Use computer and technology efficiently to collect, analyze and interpret information to gain knowledge.
D2-	Work independently or as a member of a team and manage time efficiently.	d2-	Work independently or collaboratively as a teamwork member to prepare seminars/ presentations or write reports.
D3-	Identify problems and solve them as well as make appropriate decisions when needed.	d3-	Explore and use internet resources to search for up-to-date information in the areas of interest and solve emerging problems.
D4-	Communicate effectively and search for information in internet sources.		
Teaching and Assessment Methods for Achieving Learning Outcomes			
Alignment Learning Outcomes of General and Transferable skills to Teaching and Assessment Methods:			
CILOs in general and transferable skills		Teaching strategies/methods	Methods of assessment
After participating in the course, students would be able to:		<ul style="list-style-type: none"><li>• Presentations</li><li>• Group discussions and seminars</li><li>• Self-study modules</li></ul>	<ul style="list-style-type: none"><li>• Skills assessment worksheets</li><li>• Portfolios</li></ul>
d1-	Use computer and technology efficiently to collect, analyze and interpret information to gain knowledge.		
d2-	Work independently or collaboratively as a teamwork member to prepare seminars/ presentations or write reports.		
d3-	Explore and use internet resources to search for up-to-date information in the areas of interest and solve emerging problems.		





1 – Course Topics/Items:					
a – Theoretical Aspect					
Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1	Introduction	a1; b1; d1–d3	Definitions and concepts of medical parasitology.  Parasite and its types, host and its types & vector and its types.  Types of parasite life cycles.  Classification of medically important parasites.	1	1
2	<i>Entamoeba histolytica</i> <i>Balantidium coli</i>	a1, a2; b1, b2; d1–d3	Epidemiology, morphology, life cycle, pathogenesis and clinical features, diagnosis, treatment, prevention and control of <i>E. histolytica</i> and <i>B. coli</i>	1	1
3	Pathogenic free-living amoebae <i>Acanthamebaspecies</i> <i>Naegleria fowleri</i>	a1, a2; b1, b2; d1–d3	Epidemiology, morphology, life cycle, pathogenesis and clinical features, diagnosis, treatment, prevention and control.	1	1
4	Luminal flagellates <i>Giardia lamblia</i> <i>Dientamoeba fragilis</i> <i>Trichomonas vaginalis</i>	a1–a3; b1, b2; d1–d3	Epidemiology, morphology, life cycle, pathogenesis and clinical features, diagnosis, treatment, prevention and control.	1	1
5	<i>Leishmania species</i> <i>Trypanosoma species</i>	a1–a3; b1, b2; d1–d3	Epidemiology, morphology, life cycle, pathogenesis and clinical features, diagnosis, treatment, prevention and control of: - <i>Leishmania</i> species causing cutaneous, mucocutaneous and visceral leishmaniasis. - African trypanosomes - <i>Trypanosoma cruzi</i>	1	1



6	<i>Toxoplasma gondii</i> Intestinal coccidians	a1-a3; b1, b2; d1-d3	Epidemiology, morphology, life cycle, pathogenesis and clinical features, diagnosis, treatment, prevention and control of: - <i>T. gondii</i> - <i>Cryptosporidium</i> species - <i>Cyclospora cayetenensis</i> - <i>Cystoisospora belli</i>	1	1
7	Mid-semester exam	a1-a3	-----	1	1
8	Malaria parasites	a1-a3 b1, b2; d1-d3	Epidemiology, morphology, life cycle, pathogenesis and clinical features, diagnosis, treatment, prevention and control.	1	1
9	<i>Schistosoma mansoni</i> <i>Schistosoma haematobium</i>	a1-a3; b1, b2; d1-d3	Epidemiology, morphology, life cycle, pathogenesis and clinical features, diagnosis, treatment, prevention and control.	1	1
10	<i>Taenia saginata</i> <i>Taenia solium</i>	a1-a3; b1, b2; d1-d3	Epidemiology, morphology, life cycle, pathogenesis and clinical features, diagnosis, treatment, prevention and control.	1	1
11	<i>Hymenolepis nana</i> <i>Echinococcus granulosus</i>	a1-a3; b1, b2; d1-d3	Epidemiology, morphology, life cycle, pathogenesis and clinical features, diagnosis, treatment, prevention and control.	1	1
12	Soil-transmitted helminths - <i>Ascaris lumbricoides</i> - <i>Trichuris trichiura</i> - <i>Ancylostoma duodenale</i>	a1, a2; b1, b2; d1-d3	Epidemiology, morphology, life cycle, pathogenesis and clinical features, diagnosis, treatment, prevention and control.	1	1
13	<i>Strongyloides stercoralis</i> <i>Enterobius vermicularis</i>	a1, a2; b1, b2; d1-d3	Epidemiology, morphology, life cycle, pathogenesis and clinical features, diagnosis,	1	1



			treatment, prevention and control.		
14	<i>Wuchereriabancrofti</i> <i>Onchocerca volvulus</i> <i>Dracunculus medinensis</i>	a1-a3; b1, b2; d1-d3	Epidemiology, morphology, life cycle, pathogenesis and clinical features, diagnosis, treatment, prevention and control.	2	2
15	Final Exam			1	1
Number of Weeks /and Units per Semester				16	16

b - Practical Aspect				
Order	Tasks/ Experiments	CILOs (symbols)	Number of Weeks	Contact Hours
1	<ul style="list-style-type: none"> <li><i>E. histolytica</i> &amp; <i>E. coli</i></li> <li>- Slide spots of trophozoites and cysts.</li> </ul>	c1, c2	1	1
2	<ul style="list-style-type: none"> <li><i>G. lamblia</i> &amp; <i>T. vaginalis</i></li> <li>- Slide spots of <i>G. lamblia</i> trophozoite and cyst.</li> <li>- Slide spot of <i>T. vaginalis</i> trophozoite.</li> </ul>	c1, c2	1	1
3	<ul style="list-style-type: none"> <li><i>Leishmania</i> species &amp; <i>Trypanosoma</i> species</li> <li>- Slide spots of <i>Leishmania</i> species amastigote and promastigote and <i>Trypanosoma</i> species trypomastigotes.</li> </ul>	c1, c2	1	2
4	<ul style="list-style-type: none"> <li><i>P. falciparum</i> &amp; <i>P. vivax</i></li> <li>- Blood smears of erythrocytic stages of malaria parasites (ring stages, trophozoites, schizonts and gametocytes)</li> </ul>	c1, c2	1	2
5	<ul style="list-style-type: none"> <li><i>S. mansoni</i> &amp; <i>S. haematobium</i></li> <li>- Slide spots of adult worms and eggs.</li> <li>- Shells of snail intermediate hosts.</li> </ul>	c1, c2	1	2
6	<ul style="list-style-type: none"> <li><i>T. saginata</i> &amp; <i>T. solium</i></li> <li>- Jar specimens of adult worms and their body parts.</li> <li>- Slide spots of scolices, segments</li> </ul>	c1, c2	1	2





			treatment, prevention and control.		
14	<i>Wuchereriabancrofti</i> <i>Onchocerca volvulus</i> <i>Dracunculus medinensis</i>	a1-a3; b1, b2; d1-d3	Epidemiology, morphology, life cycle, pathogenesis and clinical features, diagnosis, treatment, prevention and control.	2	2
15	Final Exam			1	1
Number of Weeks /and Units per Semester				16	16

b - Practical Aspect				
Order	Tasks/ Experiments	CILOs (symbols)	Number of Weeks	Contact Hours
1	<ul style="list-style-type: none"> <li><i>E. histolytica</i> &amp; <i>E. coli</i></li> <li>- Slide spots of trophozoites and cysts.</li> </ul>	c1, c2	1	1
2	<ul style="list-style-type: none"> <li><i>G. lamblia</i> &amp; <i>T. vaginalis</i></li> <li>- Slide spots of <i>G. lamblia</i> trophozoite and cyst.</li> <li>- Slide spot of <i>T. vaginalis</i> trophozoite.</li> </ul>	c1, c2	1	1
3	<ul style="list-style-type: none"> <li><i>Leishmania</i> species &amp; <i>Trypanosoma</i> species</li> <li>- Slide spots of <i>Leishmania</i> species amastigote and promastigote and <i>Trypanosoma</i> species trypomastigotes.</li> </ul>	c1, c2	1	2
4	<ul style="list-style-type: none"> <li><i>P. falciparum</i> &amp; <i>P. vivax</i></li> <li>- Blood smears of erythrocytic stages of malaria parasites (ring stages, trophozoites, schizonts and gametocytes)</li> </ul>	c1, c2	1	2
5	<ul style="list-style-type: none"> <li><i>S. mansoni</i> &amp; <i>S. haematobium</i></li> <li>- Slide spots of adult worms and eggs.</li> <li>- Shells of snail intermediate hosts.</li> </ul>	c1, c2	1	2
6	<ul style="list-style-type: none"> <li><i>T. saginata</i> &amp; <i>T. solium</i></li> <li>- Jar specimens of adult worms and their body parts.</li> <li>- Slide spots of scolices, segments</li> </ul>	c1, c2	1	2



<b>VII- Assignments</b>
<ul style="list-style-type: none"> <li>- Reports.</li> <li>- Homework.</li> </ul>

<b>VIII- Schedule of Assessment Tasks for Students During the Semester</b>					
<b>Assessment of Theoretical Part</b>					
No.	Assessment method	Week due	Mark	Proportion of final assessment	CILOs
1	Participation, report, homework and quizzes	Sporadic through the semester	10	10%	a1-a3; b1, b2; d1-d3
2	Practical mid-semester exam	9 <sup>th</sup>	10	10%	c1, c2
3	Theoretical mid-semester exam	8 <sup>th</sup>	20	20%	a1-a3
4	Final Exam (theoretical)	16 <sup>th</sup>	40	40%	a1-a3
5	Final Exam (practical)	16 <sup>th</sup>	20	20%	c1, c2
	<b>Total</b>		<b>100</b>	<b>100%</b>	



## Course Specification

### PHARMACEUTICAL ANALYTICAL CHEMISTRY II

I. Course Identification and General Information:							
1.	Course Title:	PHARMACEUTICAL ANALYTICAL CHEMISTRY II					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		1	1	-	1		-
4.	Study level/ semester at which this course is offered:	( 2nd ) Year – (FIRST) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"><li>• General chemistry</li><li>• Pharmaceutical Analytical chemistry I</li></ul>					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of essential principles, instrumentation and pharmaceutical applications of spectrophotometric & spectroscopic analytical methods.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the physicochemical properties of matters that are used as basis for qualitative and quantitative instrumental analysis.
2.	A3	a2. Discuss the principles, instrumentations and pharmaceutical applications of spectrophotometric & spectroscopic techniques.
3.	A4	a3. Comprehend his/her role as a pharmacist in providing precise and accurate analytical results based on implementing strict standard operative and analytical procedures.
4.	B1	b1. Interpret correctly outcome data of an instrumental analysis.
5.		b2. Solve problems related to the studied instrumental analytical techniques including identification and/or quantitation of test samples.
6.	B2	b3 .Classify instrumental analytical techniques based on their principles and applications.
7.		b4. Compare between various types of instrumental analytical techniques.
8.	B4	b5. Assess the accuracy and precision of an instrumental analytical techniques.
9.		b6. Select the appropriate technique to perform an instrumental quantitative/qualitative analysis.
10.	C1	c1.Handleefficiently the tools and chemicals used in pharmaceutical instrumental analysis Lab.
11.		c2. Operate successfully the instruments used in pharmaceutical instrumental analysis Lab.
12.	C2	c3 . Perform effectively the experiments and practical tasks including qualitative and quantitative analysis of substances in a given sample using standard procedures.
13.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
14.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
15.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.





16.	D1	d1. Share successfully in team-work.
17.	D2	d2. Behave in discipline during practicing practical and professional works and assignments.
18.	D3	d3. Communicate effectively with his/her colleagues.
19.	D4	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2	Lecture laboratory practice Feed-back learning	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam) Assignments , quizzes
b3, b4	Lecture	Written exam , Attendance
b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment,



		oral/written exam , practical exam)
<b>(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Visible and UV Spectrophotometry</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>Electromagnetic radiation, units, electromagnetic</li> <li>Light spectra</li> <li>Principle: Absorption and emission of radiation</li> <li>Lambert's and Beer's Laws</li> <li>Deviation from Lambert-Beer's law</li> <li>Instrumentation</li> <li>Colorimetry, Chromophores and Auxochromes shifts,</li> <li>Applications of Ultraviolet and Visible in quantitative analysis of drugs; data validation : calibration curve linearity, regression equation</li> <li>Applications of Ultraviolet and Visible in qualitative analysis: Wavelength of maximal absorbance with illustrates examples</li> <li>Factors Affecting Spectral Response</li> <li>Data validation: specificity, robustness</li> </ul>	3	6
2	<b>Fluorescence spectrophotometry (Fluorimetry)</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>Principle, emission and Intensity: governing law</li> <li>Instrumentation</li> <li>Applications of quantitative analysis of drugs</li> <li>Data validation: specificity, robustness</li> </ul>	1	2



3	<b>Atomic absorption &amp; Atomic emission spectrophotometry</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	Principles, instrumentations, procedures, applications of these two techniques of spectrophotometry	2	2
	MIDTERM EXAM			1	2
4	<b>Infrared spectroscopy</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• Definition and purpose, Instrumentation, Wavenumber and types of vibration of Chemical groups</li> <li>• Fourier transform infrared (FTIR) spectroscopy</li> <li>• Preparation of samples</li> <li>• Control of resolution performance</li> <li>• Verification of the wave-number scale</li> <li>• Near-infrared spectrophotometry</li> <li>• Factors Affecting Spectral Response</li> <li>• Identification using reference substances or reference spectra</li> <li>• Interpretation of IR spectra with examples</li> </ul>	3	6
5	<b>Mass spectroscopy</b>		Theoretical principle and components , components interactions , types, instrumentation, factors affecting, output data, applications in quantitative/qualitative analysis	2	4



6	<b>Nuclear magnetic resonance spectroscopy</b>		Theoretical principle and components , components interactions , types, instrumentation, factors affecting, output data, applications in quantitative/qualitative analysis	2	4
	<b>Course Review</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units



<b>B - Practical Aspect</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
<b>1.</b>	Uv-visible spectrophotometric operation & calibration	<b>1</b>	<b>2</b>	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>2.</b>	Uv-visible spectrophotometric analysis of drugs : aspirin tablets, metformine tablets , chloroquine injection, miconazole cream,	<b>4</b>	<b>8</b>	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>3.</b>	I.R. spectroscopy simulation and Interpretation of spectrum	<b>2</b>	<b>4</b>	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>4.</b>	Mass spectroscopy simulation and Interpretation of spectrum	<b>2</b>	<b>4</b>	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>5.</b>	NMR simulation and Interpretation of spectrum	<b>2</b>	<b>2</b>	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve the problems provided by the teacher at the end of each unit.	b2, c5, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a video of simulation of one of the analytical technique studied. The students of each group must explain the simulation for other students.	c5, c6, d1, d2, d4	14	2





## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2 , a3, b1, b2, b3b4,b7, b5, b6, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b2, c5, c6, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b1, b2
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2 , a3, b1, b2, b3b4,b7, b5, b6, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d4
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b2, b1, b2, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b1, b2, b5, b6,



					c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. David Harvey, modern analytical chemistry, 2000, McGraw-Hill
2. British pharmacopeia 2013

### 2- Essential References.

1. Hadkar. Instrumental methods in pharmaceutical analysis
2. Purcell. Pharmaceutical analysis

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### Pharmaceutical analytical chemistry II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of essential principles, instrumentation and pharmaceutical applications of spectrophotometric & spectroscopic analytical methods.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the physicochemical properties of matters that are used as basis for qualitative and quantitative instrumental analysis.
2.	A3	a2. Discuss the principles, instrumentations and pharmaceutical applications of spectrophotometric & spectroscopic techniques.
3.	A4	a3. Comprehend his/her role as a pharmacist in providing precise and accurate analytical results based on implementing strict standard operative and analytical procedures.
4.	B1	b1. Interpret correctly outcome data of an instrumental analysis.
5.		b2. Solve problems related to the studied instrumental analytical techniques including identification and/or quantitation of test samples.
6.	B2	b3 .Classify instrumental analytical techniques based on their principles and applications.
7.		b4. Compare between various types of instrumental analytical techniques.
8.	B4	b5. Assess the accuracy and precision of an instrumental analytical techniques.
9.		b6. Select the appropriate technique to perform an instrumental quantitative/qualitative analysis.
10.	C1	c1.Handleefficiently the tools and chemicals used in pharmaceutical instrumental analysis Lab.
11.		c2. Operate successfully the instruments used in pharmaceutical instrumental analysis Lab.
12.	C2	c3 . Perform effectively the experiments and practical tasks including qualitative and quantitative analysis of substances in a given sample using standard procedures.
13.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
14.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
15.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.



16.	D1	d1. Share successfully in team-work.
17.	D2	d2. Behave in discipline during practicing practical and professional works and assignments.
18.	D3	d3. Communicate effectively with his/her colleagues.
19.	D4	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2	Lecture laboratory practice Feed-back learning	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam) Assignments , quizzes
b3, b4	Lecture	Written exam , Attendance
b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment,



		oral/written exam , practical exam)
<b>(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Visible and UV Spectrophotometry</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>Electromagnetic radiation, units, electromagnetic</li> <li>Light spectra</li> <li>Principle: Absorption and emission of radiation</li> <li>Lambert's and Beer's Laws</li> <li>Deviation from Lambert-Beer's law</li> <li>Instrumentation</li> <li>Colorimetry, Chromophores and Auxochromes shifts,</li> <li>Applications of Ultraviolet and Visible in quantitative analysis of drugs; data validation : calibration curve linearity, regression equation</li> <li>Applications of Ultraviolet and Visible in qualitative analysis: Wavelength of maximal absorbance with illustrates examples</li> <li>Factors Affecting Spectral Response</li> <li>Data validation: specificity, robustness</li> </ul>	3	6
2	<b>Fluorescence spectrophotometry (Fluorimetry)</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>Principle, emission and Intensity: governing law</li> <li>Instrumentation</li> <li>Applications of quantitative analysis of drugs</li> <li>Data validation: specificity, robustness</li> </ul>	1	2





3	<b>Atomic absorption &amp; Atomic emission spectrophotometry</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	Principles, instrumentations, procedures, applications of these two techniques of spectrophotometry	2	2
	MIDTERM EXAM			1	2
4	<b>Infrared spectroscopy</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	<ul style="list-style-type: none"> <li>• Definition and purpose, Instrumentation, Wavenumber and types of vibration of Chemical groups</li> <li>• Fourier transform infrared (FTIR) spectroscopy</li> <li>• Preparation of samples</li> <li>• Control of resolution performance</li> <li>• Verification of the wave-number scale</li> <li>• Near-infrared spectrophotometry</li> <li>• Factors Affecting Spectral Response</li> <li>• Identification using reference substances or reference spectra</li> <li>• Interpretation of IR spectra with examples</li> </ul>	3	6
5	<b>Mass spectroscopy</b>		Theoretical principle and components , components interactions , types, instrumentation, factors affecting, output data, applications in quantitative/qualitative analysis	2	4



6	<b>Nuclear magnetic resonance spectroscopy</b>		Theoretical principle and components , components interactions , types, instrumentation, factors affecting, output data, applications in quantitative/qualitative analysis	2	4
	<b>Course Review</b>	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units



<b>B - Practical Aspect</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Couse Intended Learning Outcomes CILOs</b>
<b>6.</b>	Uv-visible spectrophometric operation & calibration	<b>1</b>	<b>2</b>	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>7.</b>	Uv-visible spectrophometric analysis of drugs : aspirin tablets, metformine tablets , chloroquine injection, miconjazole cream,	<b>4</b>	<b>8</b>	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>8.</b>	I.R. spectroscopy simulation and Interpretation of spectrum	<b>2</b>	<b>4</b>	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>9.</b>	Mass spectroscopy simulation and Interpretation of spectrum	<b>2</b>	<b>4</b>	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>10.</b>	NMR simulation and Interpretation of spectrum	<b>2</b>	<b>2</b>	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.</p> <p>The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve the problems provided by the teacher at the end of each unit.	b2, c5, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a video of simulation of one of the analytical technique studied. The students of each group must explain the simulation for other students.	c5, c6, d1, d2, d4	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2 , a3, b1, b2, b3b4,b7, b5, b6, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b2, c5, c6, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b1, b2
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2 , a3, b1, b2, b3b4,b7, b5, b6, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2 , a3, b1, b2, b3, b4, b5, b6, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	a3, b1, b2, b5, b6, c1, c2, c3, c4, c6, d4
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b2, b1, b2, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b1, b2, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. David Harvey, modern analytical chemistry, 2000, McGraw-Hill
2. British pharmacopeia 2013

### 2- Essential References.

1. Hadkar. Instrumental methods in pharmaceutical analysis
2. Purcell. Pharmaceutical analysis

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACEUTICAL ORGANIC CHEMISTRY II

I. Course Identification and General Information:							
1.	Course Title:	PHARMACEUTICAL ORGANIC CHEMISTRY II					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( SECOND ) Year – (FIRST ) semester					
5.	Pre –requisite (if any):	• Pharmaceutical organic chemistry I					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course concerns with study essential classes of organic compounds including nitrocompounds, aldehydes, ketones, carboxylic acids and acid derivatives as an introduction to specific medicinal chemistry courses.





### III. Intended learning outcomes of the course: (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No	PILOs	Intended learning outcomes of the course (CILOs)
1.	A2	a1. Explain the significance of organic chemistry in modern sciences and .
2.	A3	a2. Discuss the properties of Carbon atom, models of structural formula, specific properties and mechanisms of reactions of organic compounds.
3.	B1	b1. Interpret the influence of functional group on physical and chemical properties of organic compounds.
4.		b2. Design a plan to synthesize an organic compound from a parent compound using serial thinking .
5.	B2	b3. Classify organic compounds based on functional group.
6.		b4. Differentiate between different types of organic compounds based on their physical properties, structural formula, molecular formula and chemical reactions
7.	B3	b5 . Name organic compounds using IUPAC nomenclature rules.
8.		b6. Relate functional group in organic compounds to the physical and chemical properties of the compounds.
9.		b7. Predict the catalysts required and the outcomes of a reaction between an organic compound and other chemicals.
10.	C1.	c1. Handle efficiently the tools and chemicals used in chemistry lab.
11.		c2. Operate successfully the instruments used in chemistry lab.
12.	C2	c3 . Perform effectively experimentations of chemical reactions including identification and synthesis of organic compounds in chemistry lab using standard procedures and provide report of his work.
13.		c4 . Draw the structure of organic compounds using structural formula.
14.	C3	c6 .Take the required safety criteria during performing experiments in chemistry lab.
15.	D1	d1. Share successfully in team-work .
16.	D2	d2. Behave in discipline during performing experiments in chemistry lab
17.	D3	d3.. Communicate effectively with his/her colleagues during performing experiments in chemistry lab.
18.	D4	d4. Demonstrate time management during performing experiments in chemistry lab.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, Lecture-discussion	written exam
a2	Lecture, Lecture-discussion	written exam

### (b) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1 , b2	Lectures	Written exam
b3, b4	Lecture, Lecture-discussion , feed-back learning	written exam , assignment, quizzes
b5, b6, b7	Lecture, Lecture-discussion, feed-back learning	written exam, quizzes

### (c) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments, lab. reporting, practical exam )
c3, c4	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c5	Lab. Practice	Practical assessment (Lab accomplishment + practical exam )

### (d) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice	Practical assessment (Attitude)
d2	Lab. Practice,	Practical assessment (Lab Attitude)
d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	Aligned Course Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	<b>Aliphatic and aromatic Nitro compounds</b>	b1, b2, b3, b4, b5, b6, b7, c4	• : (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions)).	3	9
2	<b>Aliphatic and aromatic aldehydes and ketones</b>	b1, b2, b3, b4, b5, b6, b7, c4	• : (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions)	3	9
	• MID TERM EXAM			1	2
3	<b>Aliphatic and aromatic carboxylic acids</b>	b1, b2, b3, b4, b5, b6, b7, c4	• : (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions)).	4	8
4	<b>Aliphatic and aromatic derivatives of carboxylic acids</b>	b1, b2, b3, b4, b5, b6, b7, c4	<b>Esters, acyl halides, acid anhydrides:</b> • : (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions)).	3	9
5	<b>Serial synthesis</b>	b2	Synthesis of an organic compound starting from simple parent organic compound.	1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	5 units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Learning Outcomes</b>
<b>1.</b>	Physicochemical properties , reactions & synthesis of aliphatic aldehydes	<b>1</b>	<b>2</b>	a2
<b>2.</b>	Physicochemical properties , reactions & synthesis of aromatic aldehydes	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>3.</b>	Physicochemical properties , reactions & synthesis of aliphatic ketones	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>4.</b>	Physicochemical properties , reactions & synthesis of aromatic ketones	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>5.</b>	Physicochemical properties , reactions & synthesis of aliphatic carboxylic acids	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>6.</b>	Physicochemical properties , reactions & synthesis of aromatic carboxylic acids	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>7.</b>	Physicochemical properties , reactions & synthesis of aliphatic esters	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>8.</b>	Physicochemical properties , reactions & synthesis of aromatic esters	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>9.</b>	Scheme of Identification	<b>2</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>10.</b>	Review	<b>1</b>	<b>2</b>	c1, c2, c3, c4, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	a2, c1, c2, c3, c4
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**lecture - Discussion**: a short lecture/ address followed by discussion

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOS(symbols)	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve problems at home. The problems are provided by the teacher at the end of each unit. Problems are related to completion of a chemical reaction, nomenclature, draw structures, mechanisms of reactions and others. The student should deliver his/her work every second week in a specific homework booklet. The teacher may ask the student, either personally, or at the class to make sure that the student work belongs to his/her lonely effort.	b2	4- 13	3
2	<b>Group</b> : each group of students will be assigned to do a search-report about one type the mechanism of a reaction.	a3	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion % of Total course Assessment	Aligned Course Learning Outcomes
1	Attendance	1 - 15	2	2	a1, a2 b1, b2, b3, b4, b5, b6, b7, c4
2	Assignments (1 + 2)	4, 14	5	5	a3, b2
3	Quiz 1 + Quiz 2	5, 12	3	3	b2, b5, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2 b1, b2, b3, b4, b5, b6, c4
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2 b1, b2, b3, b4, b5, b6, b7, c4
TOTAL			60	60 %	

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes
1	Lab. Attendance	Weekly	5	5 %	b1, c1, c2, c3, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5 %	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5 %	b1, c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5 %	c2
5	Exam of practice theory (written exam or oral exam)	14	5	5 %	b1, c1, c2, c3
6	Practical exam (practical)	14	20	20 %	b1, c1, c2, c3
Total			40	40	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Cotton . Basic inorganic chemistry

### 2- Essential References.

2. Bothara. inorganic pharmaceutical chemistry
3. Richard E. Beilil , General chemistry Lab. Manual, 2005, Dakota State university
4. British pharmacopeia, 2013

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.





## Course Plan (Syllabus) of

### PHARMACEUTICAL ORGANIC CHEMISTRY II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	-----	Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail	-----						

II. Course Description:
The course concerns with study essential classes of organic compounds including nitrocompounds, aldehydes, ketones, carboxylic acids and acid derivatives as an introduction to specific medicinal chemistry courses.



### III. Intended learning outcomes of the course: (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No	PILOs	Intended learning outcomes of the course (CILOs)
1.	A2	a1. Explain the significance of organic chemistry in modern sciences and .
2.	A3	a2. Discuss the properties of Carbon atom, models of structural formula, specific properties and mechanisms of reactions of organic compounds.
3.	B1	b1. Interpret the influence of functional group on physical and chemical properties of organic compounds.
4.		b2. Design a plan to synthesize an organic compound from a parent compound using serial thinking .
5.	B2	b3. Classify organic compounds based on functional group.
6.		b4. Differentiate between different types of organic compounds based on their physical properties, structural formula, molecular formula and chemical reactions
7.	B3	b5 . Name organic compounds using IUPAC nomenclature rules.
8.		b6. Relate functional group in organic compounds to the physical and chemical properties of the compounds.
9.		b7. Predict the catalysts required and the outcomes of a reaction between an organic compound and other chemicals.
10.	C1.	c1. Handle efficiently the tools and chemicals used in chemistry lab.
11.		c2. Operate successfully the instruments used in chemistry lab.
12.	C2	c3 . Perform effectively experimentations of chemical reactions including identification and synthesis of organic compounds in chemistry lab using standard procedures and provide report of his work.
13.		c4 . Draw the structure of organic compounds using structural formula.
14.	C3	c6 .Take the required safety criteria during performing experiments in chemistry lab.
15.	D1	d1. Share successfully in team-work .
16.	D2	d2. Behave in discipline during performing experiments in chemistry lab
17.	D3	d3.. Communicate effectively with his/her colleagues during performing experiments in chemistry lab.
18.	D4	d4. Demonstrate time management during performing experiments in chemistry lab.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, Lecture-discussion	written exam
a2	Lecture, Lecture-discussion	written exam

### (b) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1 , b2	Lectures	Written exam
b3, b4	Lecture, Lecture-discussion , feed-back learning	written exam , assignment, quizzes
b5, b6, b7	Lecture, Lecture-discussion, feed-back learning	written exam, quizzes

### (c) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments, lab. reporting, practical exam )
c3, c4	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c5	Lab. Practice	Practical assessment (Lab accomplishment + practical exam )

### (d) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice	Practical assessment (Attitude)
d2	Lab. Practice,	Practical assessment (Lab Attitude)
d3	Lab. Practice	Practical assessment (Lab Attitude)
d4	Lab. Practice	Practical assessment (Lab Attitude)



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	Aligned Course Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	<b>Aliphatic and aromatic Nitro compounds</b>	b1, b2, b3, b4, b5, b6, b7, c4	• : (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions)).	3	9
2	<b>Aliphatic and aromatic aldehydes and ketones</b>	b1, b2, b3, b4, b5, b6, b7, c4	• : (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions)	3	9
	• MID TERM EXAM			1	2
3	<b>Aliphatic and aromatic carboxylic acids</b>	b1, b2, b3, b4, b5, b6, b7, c4	• : (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions)).	4	8
4	<b>Aliphatic and aromatic derivatives of carboxylic acids</b>	b1, b2, b3, b4, b5, b6, b7, c4	<b>Esters, acyl halides, acid anhydrides:</b> • : (definitions, types, general formula, nomenclature, influence of functional group on physical and chemical properties, radical groups nomenclature, physical properties, synthesis and reactions (including mechanisms of reactions)).	3	9
5	<b>Serial synthesis</b>	b2	Synthesis of an organic compound starting from simple parent organic compound.	1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	5 units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Learning Outcomes</b>
1.	Physicochemical properties , reactions & synthesis of aliphatic aldehydes	1	2	a2
2.	Physicochemical properties , reactions & synthesis of aromatic aldehydes	1	2	c1, c2, c3, c4, d1, d2, d3, d4
3.	Physicochemical properties , reactions & synthesis of aliphatic ketones	1	2	c1, c2, c3, c4, d1, d2, d3, d4
4.	Physicochemical properties , reactions & synthesis of aromatic ketones	1	2	c1, c2, c3, c4, d1, d2, d3, d4
5.	Physicochemical properties , reactions & synthesis of aliphatic carboxylic acids	1	2	c1, c2, c3, c4, d1, d2, d3, d4
6.	Physicochemical properties , reactions & synthesis of aromatic carboxylic acids	1	2	c1, c2, c3, c4, d1, d2, d3, d4
7.	Physicochemical properties , reactions & synthesis of aliphatic esters	1	2	c1, c2, c3, c4, d1, d2, d3, d4
8.	Physicochemical properties , reactions & synthesis of aromatic esters	1	2	c1, c2, c3, c4, d1, d2, d3, d4
9.	Scheme of Identification	2	2	c1, c2, c3, c4, d1, d2, d3, d4
10.	Review	1	2	c1, c2, c3, c4, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		1	2	a2, c1, c2, c3, c4
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b> : It depends on stimulation of the student's brain through a group of questions &/or <b>Concepts map</b> : which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using <b>learning aids</b> such as Data show projector
<b>lecture - Discussion</b> : a short lecture/ address followed by discussion
<b>Laboratory practice</b> : students doing experiments in labs individually or in small groups
<b>Feed-back learning</b> : students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation
<b>Group projects</b> : students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOS(symbols)	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve problems at home. The problems are provided by the teacher at the end of each unit. Problems are related to completion of a chemical reaction, nomenclature, draw structures, mechanisms of reactions and others. The student should deliver his/her work every second week in a specific homework booklet. The teacher may ask the student, either personally, or at the class to make sure that the student work belongs to his/her lonely effort.	b2	4- 13	3
2	<b>Group</b> : each group of students will be assigned to do a search-report about one type the mechanism of a reaction.	a3	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion % of Total course Assessment	Aligned Course Learning Outcomes
1	Attendance	1 - 15	2	2	a1, a2 b1, b2, b3, b4, b5, b6, b7, c4
2	Assignments (1 + 2)	4, 14	5	5	a3, b2
3	Quiz 1 + Quiz 2	5, 12	3	3	b2, b5, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2 b1, b2, b3, b4, b5, b6, c4
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2 b1, b2, b3, b4, b5, b6, b7, c4
TOTAL			60	60 %	

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes
1	Lab. Attendance	Weekly	5	5 %	b1, c1, c2, c3, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5 %	d1, d2, d3, d4
3	Lab. Accomplishments	weekly	5	5 %	b1, c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5 %	c2
5	Exam of practice theory (written exam or oral exam)	14	5	5 %	b1, c1, c2, c3
6	Practical exam (practical)	14	20	20 %	b1, c1, c2, c3
Total			40	40	





## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Cotton . Basic inorganic chemistry

### 2- Essential References.

2. Bothara. inorganic pharmaceutical chemistry
3. Richard E. Beilil , General chemistry Lab. Manual, 2005, Dakota State university
4. British pharmacopeia, 2013

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACEUTICAL ORGANIC CHEMISTRY III

I. Course Identification and General Information:							
1.	Course Title:	PHARMACEUTICAL ORGANIC CHEMISTRY III					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( SECOND ) Year – ( SECOND ) semester					
5.	Pre –requisite (if any):	• Pharmaceutical Organic chemistry II					
6.	Co –requisite (if any):	Nil					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of synthesis and reactions of homocyclic and heterocyclic organic compounds that represent the structural cores of many drugs.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Describe the physicochemical properties and reactions of the common homocyclic and heterocyclic organic compounds from which drugs are synthesized.
2.	A3	a2. Discuss the principles, mechanisms and technologies applied in synthesis of drugs from organic compounds.
3.	A4	a3. Recognize his/her mission as pharmacist in chemical synthesis of drugs.
4.	B1	b1. Name and draw the structure a homocyclic and heterocyclic organic compound using IUPAC rules.
5.		b2. Interpret the similarities of drug activity based on similarities of their chemical structures.
6.	B2	b3. Solve chemical problems related to nomenclature, synthesis or reactions of drugs-related homocyclic and heterocyclic organic compounds.
7.		b4. Classify homocyclic and heterocyclic organic compounds.
8.	B3	b5. Develop a sequence of reactions to synthesize a drug chemically from a parent organic compound.
9.		b6. Predict the outcomes of a chemical reaction of homocyclic and heterocyclic organic compounds.
10.	B4	b7. Select the catalyst and assisting conditions required to complete the reactions of drug synthesis
11.	C1	c1. Handle efficiently the tools and chemicals used in pharmaceutical organic chemistry Lab.
12.		c2. Operate successfully the instruments used in pharmaceutical organic chemistry Lab.
13.	C2	c3. Perform efficiently experiments and practical tasks to synthesize and identify drugs chemically using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical works in the pharmaceutical organic chemistry Lab.
15.	C4	c5. Use effectively symbols and figures and drawing to express chemical reactions and synthesis.
16.		c6. Appropriately search for information and also present and report



		his/her work using various source of information and media technologies.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. behave in discipline during practicing practical works.
19.	D3	d3. Communicate effectively with his/her colleagues in the pharmaceutical organic chemistry Lab.
20.	D4	d4. Demonstrate time management and self-learning during performing practical works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	written exam , Practical assessment (Lab accomplishments, Lab. Reporting , practical exam)
a2	Lecture	written exam
a3	Lecture	written exam

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lab practice, feed-back learning	Written exam, practical assessment (lab. accomplishment, practical exam), assignments
b3 , b4	Lecture, , feed-back learning, , Group-project.	written exam , assignment , quiz
b5, b6	Lecture	written exam, quizzes
b7	Lecture , Laboratory practice	written exam , practical assessment ( Practical exam)



**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c3	Lab. Practice	Practical assessment (Lab activity + practical exam )
c4	lab. practice	Practical assessment (Lab activity + practical exam )
c5, c6	lecture, feed-back learning	Written- exam , practical assessment (Lab. Reporting), assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice ,Group-project , , feed-back learning	Assignment , Practical assessment (Lab Reporting & Attitude).
d2	Lab. Practice ,Group-project, Filed-training	Practical assessment (Lab Attitude)
d3	Lab. Practice ,Group-project	Practical assessment (Lab Attitude)
d4	Lab. Practice , Group-project	Practical assessment (Lab Attitude)



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Monocyclic Alicyclic compounds</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	3
2	<b>Benzyl and Benzhydryl derivatives</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	3
3	<b>Phenethyl and Phenylpropylamines</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	2	6
4	<b>Arylacetic and Arylpropionic Acids</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	2	6
<b>MID-TERM EXAM</b>				1	2
5	<b>Arylethylenes compounds</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	3
6	<b>Polycyclic Aromatic compounds</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	2	6
7	<b>Steroids</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	6
8	<b>Heterocyclic compounds: 5, 6, 7 – membered fused to</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	3	9



	one ring and two rings				
Course Review	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Review of the course topics by discussion session.	1	3	
FINAL - EXAM			1	3	
TOTAL			16	47	
Number of Weeks /and Units Per Semester			16 weeks	8 Units	





<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
<b>General physicochemical properties of the chemical group. experiments of Chemical identification of drugs belonging to the following groups</b>				
1.	Monocyclic Alicyclic compounds : Hyoscine	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
2.	Benzyl and Benzhydryl derivatives : Orphenadine	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
3.	Phenethyl and Phenylpropylamines: methyldopa	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
4.	Arylacetic and Arylpropionic Acids : Thyroxin	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
5.	Polycyclic Aromatic compounds : Tetracycline	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
6.	Heterocyclic compounds: ascorbic acid	1	6	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
<b>chemical synthesis of drugs</b>				
7.	Synthesis of aspirin	2	4	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
8.	synthesis of paracetamol	3	6	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		1	2	a1, a2, b2, b3, b6, c1, c2, c3, c4, c5, d1, d2, d3, d4
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.</p> <p>The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search-report supported by illustrating figures for all drugs belonging to one of the studied homocyclic/hetrocyclic organic compounds.	d1, c6	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5
2	Assignments (1 + 2)	4-13, 14	5	5	b3, c5, c6, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3 , b4, b5, b6
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5	d2, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
4	Lab. Reporting	weekly	2.5	2.5	a1, c4, d1
5	Exam of practice theory (written exam or oral exam)	14	5	5	c6
6	Practical exam (practical)	14	20	20	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Daniel Ledincer : Organic chemistry of drug synthesis, John Wiley & Sons

### 2- Essential References.

1. Saraf. The chemistry of heterocyclic compounds
2. Anil. A text book of pharmaceutical organic chemistry
3. British pharmacopeia BP, 2013
4. United states pharmacopeia USP, 31
5. Ali. A text book of pharmaceutical organic chemistry

### 3- Electronic Materials and Web Sites etc.

- [www.en.wikipedia.org/](http://www.en.wikipedia.org/)
- [www.usp.org](http://www.usp.org)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### Pharmaceutical organic chemistry III

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course deals with the study of synthesis and reactions of homocyclic and heterocyclic organic compounds that represent the structural cores of many drugs.</p>



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Describe the physicochemical properties and reactions of the common homocyclic and heterocyclic organic compounds from which drugs are synthesized.
2.	A3	a2. Discuss the principles, mechanisms and technologies applied in synthesis of drugs from organic compounds.
3.	A4	a3. Recognize his/her mission as pharmacist in chemical synthesis of drugs.
4.	B1	b1. Name and draw the structure a homocyclic and heterocyclic organic compound using IUPAC rules.
5.		b2. Interpret the similarities of drug activity based on similarities of their chemical structures.
6.	B2	b3. Solve chemical problems related to nomenclature, synthesis or reactions of drugs-related homocyclic and heterocyclic organic compounds.
7.		b4. Classify homocyclic and heterocyclic organic compounds.
8.	B3	b5. Develop a sequence of reactions to synthesize a drug chemically from a parent organic compound.
9.		b6. Predict the outcomes of a chemical reaction of homocyclic and heterocyclic organic compounds.
10.	B4	b7. Select the catalyst and assisting conditions required to complete the reactions of drug synthesis
11.	C1	c1. Handle efficiently the tools and chemicals used in pharmaceutical organic chemistry Lab.
12.		c2. Operate successfully the instruments used in pharmaceutical organic chemistry Lab.
13.	C2	c3. Perform efficiently experiments and practical tasks to synthesize and identify drugs chemically using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical works in the pharmaceutical organic chemistry Lab.
15.	C4	c5. Use effectively symbols and figures and drawing to express chemical reactions and synthesis.
16.		c6. Appropriately search for information and also present and report



		his/her work using various source of information and media technologies.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. behave in discipline during practicing practical works.
19.	D3	d3. Communicate effectively with his/her colleagues in the pharmaceutical organic chemistry Lab.
20.	D4	d4. Demonstrate time management and self-learning during performing practical works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	written exam , Practical assessment (Lab accomplishments, Lab. Reporting , practical exam)
a2	Lecture	written exam
a3	Lecture	written exam

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lab practice, feed-back learning	Written exam, practical assessment (lab. accomplishment, practical exam), assignments
b3 , b4	Lecture, , feed-back learning, , Group-project.	written exam , assignment , quiz
b5, b6	Lecture	written exam, quizzes
b7	Lecture , Laboratory practice	written exam , practical assessment ( Practical exam)





**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment (Lab accomplishments + practical exam )
c3	Lab. Practice	Practical assessment (Lab activity + practical exam )
c4	lab. practice	Practical assessment (Lab activity + practical exam )
c5, c6	lecture, feed-back learning	Written- exam , practical assessment (Lab. Reporting), assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Lab. Practice ,Group-project , , feed-back learning	Assignment , Practical assessment (Lab Reporting & Attitude).
d2	Lab. Practice ,Group-project, Filed-training	Practical assessment (Lab Attitude)
d3	Lab. Practice ,Group-project	Practical assessment (Lab Attitude)
d4	Lab. Practice , Group-project	Practical assessment (Lab Attitude)



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Monocyclic Alicyclic compounds</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	3
2	<b>Benzyl and Benzhydryl derivatives</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	3
3	<b>Phenethyl and Phenylpropylamines</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	2	6
4	<b>Arylacetic and Arylpropionic Acids</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	2	6
<b>MID-TERM EXAM</b>				1	2
5	<b>Arylethylenes compounds</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	3
6	<b>Polycyclic Aromatic compounds</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	2	6
7	<b>Steroids</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	1	6
8	<b>Heterocyclic compounds: 5, 6, 7 – membered fused to</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, b7, c5	Classification, physicochemical properties, preparation, reactions, examples of drugs and their medical uses.	3	9



	one ring and two rings				
Course Review	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5	Review of the course topics by discussion session.	1	3	
FINAL - EXAM			1	3	
TOTAL			16	47	
Number of Weeks /and Units Per Semester			16 weeks	8 Units	



<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
<b>General physicochemical properties of the chemical group. experiments of Chemical identification of drugs belonging to the following groups</b>				
1.	Monocyclic Alicyclic compounds : Hyoscine	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
2.	Benzyl and Benzhydryl derivatives : Orphenadine	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
3.	Phenethyl and Phenylpropylamines: methyldopa	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
4.	Arylacetic and Arylpropionic Acids : Thyroxin	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
5.	Polycyclic Aromatic compounds : Tetracycline	1	2	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
6.	Heterocyclic compounds: ascorbic acid	1	6	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
<b>chemical synthesis of drugs</b>				
7.	Synthesis of aspirin	2	4	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
8.	synthesis of paracetamol	3	6	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
<b>PRACTICAL EXAM</b>		1	2	a1, a2, b2, b3, b6, c1, c2, c3, c4, c5, d1, d2, d3, d4
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.  
The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to do a search-report supported by illustrating figures for all drugs belonging to one of the studied homocyclic/hetrocyclic organic compounds.	d1, c6	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5
2	Assignments (1 + 2)	4-13, 14	5	5	b3, c5, c6, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3 , b4, b5, b6
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2,b3, b4, b5,b6, b7, c5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
2	Lab. Attitude	weekly	2.5	2.5	d2, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
4	Lab. Reporting	weekly	2.5	2.5	a1, c4, d1
5	Exam of practice theory (written exam or oral exam)	14	5	5	c6
6	Practical exam (practical)	14	20	20	a1, a3, b1, b6, b7, c1, c2, c3, c4, c5, d1, d2, d3, d4
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Daniel Ledincer : Organic chemistry of drug synthesis, John Wiley & Sons

### 2- Essential References.

1. Saraf. The chemistry of heterocyclic compounds
2. Anil. A text book of pharmaceutical organic chemistry
3. British pharmacopeia BP, 2013
4. Ali. A text book of pharmaceutical organic chemistry

### 3- Electronic Materials and Web Sites etc.

- [www.en.wikipedia.org/](http://www.en.wikipedia.org/)
- [www.usp.org](http://www.usp.org)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.





## Course Specification " PATHOLOGY"

I. Course Identification and General Information:							
1.	Course Title:	PATHOLOGY					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( 2nd ) Year – (2nd) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"><li>• Anatomy</li><li>• histology</li><li>• Physiology I</li></ul>					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

II. Course Description:
The course provides the students with essential knowledge of mechanisms of diseases including alterations in body system and their associated pathological features.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the mechanisms by which diseases occur.
2.		a2. Determine the pathological changes in normal body systems that occur during diseases.
3.	B1	b1. Differentiate between common pathological features such as inflammation, lesions, etc.
4.		b2. Interpret pathological features of diseases.
5.		b3. Relate between pathological features and diseases progress.
6.	B2	b4. Predict progress of common type of diseases.
7.	B4	b5. Assess the stage of disease progress.
8.	C4	c1. Search efficiently for information using documented and electronic sources of information.
9.		c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. work successfully in team-work.
11.	D2	d2. Show respect to life.
12.	D3	d3. Communicate effectively with colleagues.
13.	D4	d4. Demonstrate the ability of time management and self-learning skills.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:



Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam , Attendance, quizzes
b3	Lecture	Written exam , Attendance
b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture , feed-back learning	Written exam , Attendance
<b>(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments



#### IV. Course Content:

Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Course Learning Outcomes
1	<b>Introduction</b>	<ul style="list-style-type: none"> <li>Importance of the study of pathology</li> <li>Definition of terms</li> <li>Methods and techniques</li> <li>Cellular and Tissue changes</li> </ul> <b>Cell injury</b> : mechanisms, failure of cell repair, cell death; apoptosis , adaptation electrolyte imbalance.	2	4	a1, a2, b1, b2, b3, b4, b5
2	<b>Alteration in body fluids and electrolytes and acid-base balance:</b>	mechanism, prognosis	2	4	a1, a2, b1, b2, b3, b4, b5
3	<b>Pathological Alteration in body defense:</b>	stress, inflammation, lesions, alteration in tissue repair , fever, alteration in immune response : allergy and hypersensitivity	2	4	a1, a2, b1, b2, b3, b4, b5
• Mid-term exam			1	2	
4	<b>Pathological Alteration in body defense (immunity)</b>	alteration in immune response immunopathology, immunodeficiency	2	4	a1, a2, b1, b2, b3, b4, b5
5	<b>Genetic impact on diseases</b>	<ul style="list-style-type: none"> <li>Diseases caused by single – gene defects</li> <li>-Disorders with multifactor polygenic inheritance</li> <li>Cytogenetic disorders</li> <li>(Down s syndrome )</li> <li>sex chromosome disorders</li> <li>kline felters syndrome XYY</li> </ul>	2	4	a1, a2, b1, b2, b3, b4, b5
6	<b>Pathological Alterations in the Hematologic System</b>	alteration in blood cells count alteration in blood count	2	4	a1, a2, b1, b2, b3, b4, b5
7	<b>Pathology of cancer</b>	etiology, carcinogenic agents, cellular ad histological changes, types of	2	4	a1, a2, b1, b2, b3, b4, b5



	cancers			
	Course Review	1	2	
	Final exam	1		a1, a2, b1, b2, b3, b4, b5
<b>Number of Weeks /and Units Per Semester</b>		<b>16</b>	<b>32</b>	<b>7 units</b>

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Field training**: each 2-3 students are commissioned to do certain assignments in a real field entity such as drug factory, hospitals, pharmacies under supervision of both the field principle and an academic supervisor

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one pathological features such as inflammation, lesion, allergy, etc.	c1, c2, d4	4	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on a correlation of one disease to its pathological features.	c1, c2, d1, d3, d4	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a2, a2, b1, b2, b3, b4, b5, d2
2	Assignments (1 + 2)	4, 14	10	10	c1, c2, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b4, b5, b6, b3, b8, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a2, a2, b1, b2, b3, b4, b5, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a2, a2, b1, b2, b3, b4, b5, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s)</b>	
1. James OD Oxford Textbook of Pathology, Oxford press, 2012.	
<b>2- Essential References.</b>	
1. John H. Bircky , Essentials of Anatomic and Clinical Pathology , 2 <sup>nd</sup> ed. (2001). Health Professions Institute.	
<b>3- Electronic Materials and Web Sites etc.</b>	
	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>



## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.





## Course Plan (Syllabus) of PATHOLOGY

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							X

## II. Course Description:

The course provides the students with essential knowledge of mechanisms of diseases including alterations in body system and their associated pathological features.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the mechanisms by which diseases occur.
2.		a2. Determine the pathological changes in normal body systems that occur during diseases.
3.	B1	b1. Differentiate between common pathological features such as inflammation, lesions, etc.
4.		b2. Interpret pathological features of diseases.
5.		b3. Relate between pathological features and diseases progress.
6.	B2	b4. Predict progress of common type of diseases.
7.	B4	b5. Assess the stage of disease progress.
8.	C4	c1. Search efficiently for information using documented and electronic sources of information.
9.		c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. work successfully in team-work.
11.	D2	d2. Show respect to life.
12.	D3	d3. Communicate effectively with colleagues.
13.	D4	d4. Demonstrate the ability of time management and self-learning skills.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam , Attendance,



		quizzes
b3	Lecture	Written exam , Attendance
b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture , feed-back learning	Written exam , Attendance
<b>(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
d1, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments



#### IV. Course Content:

Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Course Learning Outcomes
1	<b>Introduction</b>	<ul style="list-style-type: none"> <li>Importance of the study of pathology</li> <li>Definition of terms</li> <li>Methods and techniques</li> <li>Cellular and Tissue changes</li> </ul> <b>Cell injury</b> : mechanisms, failure of cell repair, cell death; apoptosis , adaptation electrolyte imbalance.	2	4	a1, a2, b1, b2, b3, b4, b5
2	<b>Alteration in body fluids and electrolytes and acid-base balance:</b>	mechanism, prognosis	2	4	a1, a2, b1, b2, b3, b4, b5
3	<b>Pathological Alteration in body defense:</b>	stress, inflammation, lesions, alteration in tissue repair , fever, alteration in immune response : allergy and hypersensitivity	2	4	a1, a2, b1, b2, b3, b4, b5
• Mid-term exam			1	2	
4	<b>Pathological Alteration in body defense (immunity)</b>	alteration in immune response immunopathology, immunodeficiency	2	4	a1, a2, b1, b2, b3, b4, b5
5	<b>Genetic impact on diseases</b>	<ul style="list-style-type: none"> <li>Diseases caused by single – gene defects</li> <li>-Disorders with multifactor polygenic inheritance</li> <li>Cytogenetic disorders</li> <li>(Down s syndrome )</li> <li>sex chromosome disorders</li> <li>kline felters syndrome XYY</li> </ul>	2	4	a1, a2, b1, b2, b3, b4, b5
6	<b>Pathological Alterations in the Hematologic System</b>	alteration in blood cells count alteration in blood count	2	4	a1, a2, b1, b2, b3, b4, b5
7	<b>Pathology of cancer</b>	etiology, carcinogenic agents, cellular ad histological changes, types of	2	4	a1, a2, b1, b2, b3, b4, b5



	cancers			
	Course Review	1	2	
	Final exam	1		a1, a2, b1, b2, b3, b4, b5
<b>Number of Weeks /and Units Per Semester</b>		<b>16</b>	<b>32</b>	<b>7 units</b>

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Field training**: each 2-3 students are commissioned to do certain assignments in a real field entity such as drug factory, hospitals, pharmacies under supervision of both the field principle and an academic supervisor

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one pathological features such as inflammation, lesion, allergy, etc.	c1, c2, d4	4	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on a correlation of one disease to its pathological features.	c1, c2, d1, d3, d4	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a2, a2, b1, b2, b3, b4, b5, d2
2	Assignments (1 + 2)	4, 14	10	10	c1, c2, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b4, b5, b6, b3, b8, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a2, a2, b1, b2, b3, b4, b5, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a2, a2, b1, b2, b3, b4, b5, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s)</b>	
1. James OD Oxford Textbook of Pathology, Oxford press, 2012.	
<b>2- Essential References.</b>	
1. John H. Bircky , Essentials of Anatomic and Clinical Pathology , 2 <sup>nd</sup> ed. (2001). Health Professions Institute.	
<b>3- Electronic Materials and Web Sites etc.</b>	
	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>



## IX. Course Policies:

7.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
8.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
9.	<b>Exam Attendance/Punctuality:</b> Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
10.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
11.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
12.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.





## Course Specification

### PHARMACEUTICAL MICROBIOLOGY I

I. Course Identification and General Information:					
1.	Course Title:	PHARMACEUTICAL MICROBIOLOGY I			
2.	Course Code & Number:				
3.	Credit hours:	C.H			TOTAL
		Theoretical		P.	
		L.	Tut.	S.	
		2	-	-	3
4.	Study level/ semester at which this course is offered:	( SECOND ) Year – ( SECOND ) semester			
5.	Pre –requisite (if any):	• General biology			
6.	Co –requisite (if any):	none			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10.	Prepared By:				
11.	Date of Approval	2015			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals study of pathogenic microorganisms and their infections as well the applications of microbiology in pharmacy.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify and describe the microscopical features of common pathogenic microorganisms including bacteria, fungi, rickettsia and others.
2.		a2. Determine pathogenicity, management of spread and treatment of common pathogenic microorganisms including bacteria, fungi, rickettsia and others.
3.	A2	a3. Discuss the principles and technologies of microbiology applied in pharmacy for microbial investigations, product preservation, sterilization and assessment of antimicrobial activity.
4.	A4	a4. Comprehend his/her role as a pharmacist in applying microbiology knowledge for pharmaceutical applications.
5.	B1	b1. Differentiate between similar microorganisms such as streptococci and staphylococci using microscopical methods.
6.		b2. Interpret the data of inhibition zone obtained after antimicrobial activity assessment.
7.	B2	b3. Classify bacteria, fungi and other studied microorganisms into categories based on their morphologies, life-pattern and pathogenicity.
8.		b4. Relate the severity of microbial infection to its affecting factors such as immunity.
9.	B3	b5. Assess the sensitivity of microbial pathogens to antimicrobials.
10.		b6. Select the appropriate method for preservation and sterilization
11.	C1	c1. Handle efficiently the tools and chemicals used in microbiology Lab.
12.		c2. Operate successfully the instruments used in microbiology Lab
13.	C2	c3. Perform effectively the experiments and practical tasks in microbiology Lab. including microscopical investigation of microorganism, assessment of antimicrobial activity, determination of microbial content, preparation of culture media, etc., using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works
15.	C4	c5. Search efficiently for information using documented and electronic sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.



17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Show respect to life& Behave in discipline during practicing practical and professional works and assignments.
19.	D3	d3. Communicate effectively with his/her colleagues.
20.	D4	d4. Demonstrate the ability of time management and self-learning..

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, Lecture	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam), Written exam , Attendance
a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance, quizzes
a4	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes
b4	Lecture	Written exam , Attendance



b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6 c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture , lab. practice	Written exam , Attendance, lab. attitude



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to Microbiology</b>	b2, d2	<ul style="list-style-type: none"> <li>Definition, brief history, role in medical sciences</li> <li>Prokaryotes and Eukaryotes</li> <li>Role of microorganisms in life</li> <li>Classification of microorganisms.</li> </ul>	1	2
2	<b>Bacteria</b>	a1, a2,a3, a4, b1, b3, b4,d2	<ul style="list-style-type: none"> <li>Nomenclature , Morphology and fine structures, biological process : (growth, reproduction , nutrition)</li> <li>Classification</li> <li>Study of the microscopical features , common infections and culture media of pathogenic bacteria e.g. Staphylococci , Streptococci, Neisseriae, E.coli, pseudomonas, , Mycobacteria , Vibrio , Mycoplasma , Ureaplasma, Chlamydia etc.</li> </ul>	3	6
3	<b>Micro-organisms other than bacteria</b>	a1, a2,a3, a4, b1, b3, b4,d2	<ul style="list-style-type: none"> <li><b>Fungi:</b> Types, morphology, Reproduction and physiology. Pathogenic yeasts , dermatophytes, aspergillus</li> <li><b>Rickettsiae:</b> Introduction, characteristics, Pathogenic rickettsiae, laboratory diagnosis of rickettsiai diseases.</li> <li><b>Viruses:</b> History of viruses. Classification. Characteristics. Reproduction and culture of viruses. Virus inhibition. Control of virus infections.</li> </ul>	3	6
MID-TERM EXAM				1	2
4	<b>Application of microbiology</b>	a3, a4, d2 b2, b5, b6	<ul style="list-style-type: none"> <li>Methods of Preservation and</li> </ul>	6	



	<b>in pharmacy</b>		sterilization of pharmaceutical preparations <ul style="list-style-type: none"> <li>• common pharmaceutical preservatives</li> <li>• Pharmacopeial requirements of microbial contents in various pharmaceutical dosage forms.</li> <li>• Procedures for microbial content test</li> <li>• Culture media preparation</li> <li>• Study of antimicrobial activity of drugs : methods, culture media, etc.</li> </ul>		12
<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Review of the course topics by discussion session.		1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	Units

## B - Practical Aspect:



Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	introduction to the Lab.: safety requirements, list of experiments, How to report, source of errors, etc.	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
2.	Sterilization & disinfection of plastic and glasswares	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
3.	Preparation of culture media and inoculums for microorganisms	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
4.	Wet preparation & Microscopical characteristics differentiation of bacteria: streptococci, staphylococci, E.coli, pseudomonas aueroginoa, Nesseria, M. tuberculosis.	3	6	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
5.	Microscopical characterstics differentiation of Fungi Candida albicans.	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
6.	Antimicrobial activity of certain antimicrobial disks.	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
7.	Antimicrobial activity of certain antimicrobial dermatological products using dilution method	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
8.	Determination of microbial content (e.g. staphylococci) in pharmaceutical product : paracetamol syrup	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
9.	Testing of sterility of pharmaceutical products	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	





## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search report on the pharmacopeial specification of microbial content and sensitivity inhibition zone of one of the studied microbial pathogen.	c5, c6,	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on natural substances (e.g. plant, minerals) that have antimicrobial activity against one of the studied microbial pathogen.	c5, c6, d1, d3,	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester



Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2
2	Assignments (1 + 2)	4-13, 14	5	5	c5, c6, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	3	3	a3, b1
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2,a3, a4 , b1, b2,b3, b4 , d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b1, b2, b4, b5, b6
6	Practical exam (practical)	14	20	20	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6,
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Chandrakanty pharmaceutical microbiology



## 2- Essential References.

1. W. B. Hugo: pharmaceutical microbiology, 1998, Black well science LTD.
2. Aulton, pharmaceuticals the science of dosage form design, 2002, Churchill Livingstone
3. Kar. Pharmaceutical microbiology

## 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of PHARMACEUTICAL MICROBIOLOGY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals study of pathogenic microorganisms and their infections as well the applications of microbiology in pharmacy.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify and describe the microscopical features of common pathogenic microorganisms including bacteria, fungi, rickettsia and others.
2.		a2. Determine pathogenicity, management of spread and treatment of common pathogenic microorganisms including bacteria, fungi, rickettsia and others.
3.	A2	a3. Discuss the principles and technologies of microbiology applied in pharmacy for microbial investigations, product preservation, sterilization and assessment of antimicrobial activity.
4.	A4	a4. Comprehend his/her role as a pharmacist in applying microbiology knowledge for pharmaceutical applications.
5.	B1	b1. Differentiate between similar microorganisms such as streptococci and staphylococci using microscopical methods.
6.		b2. Interpret the data of inhibition zone obtained after antimicrobial activity assessment.
7.	B2	b3. Classify bacteria, fungi and other studied microorganisms into categories based on their morphologies, life-pattern and pathogenicity.
8.		b4. Relate the severity of microbial infection to its affecting factors such as immunity.
9.	B3	b5. Assess the sensitivity of microbial pathogens to antimicrobials.
10.		b6. Select the appropriate method for preservation and sterilization
11.	C1	c1. Handle efficiently the tools and chemicals used in microbiology Lab.
12.		c2. Operate successfully the instruments used in microbiology Lab
13.	C2	c3. Perform effectively the experiments and practical tasks in microbiology Lab. including microscopical investigation of microorganism, assessment of antimicrobial activity, determination of microbial content, preparation of culture media, etc., using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works
15.	C4	c5. Search efficiently for information using documented and electronic sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.



17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Show respect to life& Behave in discipline during practicing practical and professional works and assignments.
19.	D3	d3. Communicate effectively with his/her colleagues.
20.	D4	d4. Demonstrate the ability of time management and self-learning..

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, Lecture	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam), Written exam , Attendance
a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance, quizzes
a4	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes
b4	Lecture	Written exam , Attendance



b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6 c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture , lab. practice	Written exam , Attendance, lab. attitude





## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to Microbiology</b>	b2, d2	<ul style="list-style-type: none"> <li>Definition, brief history, role in medical sciences</li> <li>Prokaryotes and Eukaryotes</li> <li>Role of microorganisms in life</li> <li>Classification of microorganisms.</li> </ul>	1	2
2	<b>Bacteria</b>	a1, a2,a3, a4, b1, b3, b4,d2	<ul style="list-style-type: none"> <li>Nomenclature , Morphology and fine structures, biological process : (growth, reproduction , nutrition)</li> <li>Classification</li> <li>Study of the microscopical features , common infections and culture media of pathogenic bacteria e.g. Staphylococci , Streptococci, Neisseriae, E.coli, pseudomonas, , Mycobacteria , Vibrio , Mycoplasma , Ureaplasma, Chlamydia etc.</li> </ul>	3	6
3	<b>Micro-organisms other than bacteria</b>	a1, a2,a3, a4, b1, b3, b4,d2	<ul style="list-style-type: none"> <li><b>Fungi:</b> Types, morphology, Reproduction and physiology. Pathogenic yeasts , dermatophytes, aspergillus</li> <li><b>Rickettsiae:</b> Introduction, characteristics, Pathogenic rickettsiae, laboratory diagnosis of rickettsiai diseases.</li> <li><b>Viruses:</b> History of viruses. Classification. Characteristics. Reproduction and culture of viruses. Virus inhibition. Control of virus infections.</li> </ul>	3	6
MID-TERM EXAM				1	2
4	<b>Application of microbiology</b>	a3, a4, d2 b2, b5, b6	<ul style="list-style-type: none"> <li>Methods of Preservation and</li> </ul>	6	



	<b>in pharmacy</b>		sterilization of pharmaceutical preparations • common pharmaceutical preservatives • Pharmacopeial requirements of microbial contents in various pharmaceutical dosage forms. • Procedures for microbial content test • Culture media preparation • Study of antimicrobial activity of drugs : methods, culture media, etc.		12
<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Review of the course topics by discussion session.		1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	Units



## B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	introduction to the Lab.: safety requirements, list of experiments, How to report, source of errors, etc.	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
2.	Sterilization & disinfection of plastic and glasswares	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
3.	Preparation of culture media and inoculums for microorganisms	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
4.	Wet preparation & Microscopical characteristics differentiation of bacteria: streptococci, staphylococci, E.coli, pseudomonas aueroginoa, Nesseria, M. tuberculosis.	3	6	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
5.	Microscopical characterstics differentiation of Fungi Candida albicans.	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
6.	Antimicrobial activity of certain antimicrobial disks.	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
7.	Antimicrobial activity of certain antimicrobial dermatological products using dilution method	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
8.	Determination of microbial content (e.g. staphylococci) in pharmaceutical product : paracetamol syrup	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
9.	Testing of sterility of pharmaceutical products	1	2	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## VI. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.</p> <p>The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VII. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search report on the pharmacopeial specification of microbial content and sensitivity inhibition zone of one of the studied microbial pathogen.	c5, c6,	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on natural substances (e.g. plant, minerals) that have antimicrobial activity against one of the studied microbial pathogen.	c5, c6, d1, d3,	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2
2	Assignments (1 + 2)	4-13, 14	5	5	c5, c6, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	3	3	a3, b1
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2,a3, a4 , b1, b2,b3, b4 , d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6, d1, d3, d4,
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b1, b2, b4, b5, b6
6	Practical exam (practical)	14	20	20	a1, a4, b1, b2,b6,c1, c2, c3, c4, c6,
Total			40	40 %	



## IX. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Chandrakanty pharmaceutical microbiology

### 2- Essential References.

1. W. B. Hugo: pharmaceutical microbiology, 1998, Black well science LTD.
2. Aulton, pharmaceutics the science of dosage form design, 2002, Churchill Livingstone
3. Kar. Pharmaceutical microbiology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACEUTICS I

I. Course Identification and General Information:							
1.	Course Title:	PHARMACEUTICS I					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( 2nd ) Year – (FIRST) semester					
5.	Pre –requisite (if any):						
6.	Co –requisite (if any):	BIOPHYSICS &physical pharmacy					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course provides introduction to pharmaceuticals as a science of dosage form design and also deals with the study of non-sterile liquid pharmaceutical preparations.





### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Identify the significance of pharmaceuticals and the need to pharmaceutical dosage forms.
2.		a2. Identify the reason and type of pharmaceutical incompatibilities frequently encountered during formulation of pharmaceutical dosage forms.
3.		a3. Explicit the general properties, advantages and disadvantages of pharmaceutical liquid dosage forms.
4.	A3	a4. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types pharmaceutical liquid dosage forms.
5.		a5. Explicit the types and roles of excipients included in different types of pharmaceutical liquid dosage forms.
6.	A4	a6. Comprehend his/her role as pharmacist in formulation of pharmaceutical dosage forms.
7.	B1	b1. Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a pharmaceutical formula.
8.	B2	b2 . Classify pharmaceutical dosage forms and categorize liquid dosage forms .
9.		b3. Compare between various types of pharmaceutical liquid dosage forms in particular between old and current dosage forms and between solutions and dispersion liquids.
10.		b4. Relate the selection of excipients and the method of preparation of pharmaceutical liquid dosage forms to formulation, compatibility and stability factors.
11.	B3	b5. Formulate the active ingredient and excipients into an appropriate pharmaceutical liquid dosage forms.
12.	B4	b6 . Assess the quality of the prepared pharmaceutical liquid dosage
13.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceuticals Lab.
14.		c2. Operate successfully the instruments used in pharmaceuticals Lab.
15.	C2	c3. Prepare successfully pharmaceutical liquid dosage forms using standard procedures.
16.	C3	c4 .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceuticals Lab.



17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. behave in discipline during practical works.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4. Demonstrate time management and self-learning skills during performing assignments and practical works.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture	Written exam , Attendance
a4, a5	Lecture	Written exam , Attendance
a6	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2, b3, b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to



<b>Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1, c2, c3, c4</b>	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
<b>c5</b>	Feed-back learning, Group-project	Assignments
<b>c6</b>	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d2, d3</b>	laboratory practice, Feed-back learning, group project	Practical assessment (Lab. attendance, attitude, practical exam), Assignments
<b>d4</b>	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) , Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1	definitions and brief history of pharmaceuticals, dosage forms, pharmacopeia, active ingredients, excipients.	1	2
2	<b>Compounded prescriptions</b>	a2	formula, incompatibilities, general operations (maceration, percolation, filtration, mixing, size-reducing, etc)	2	4
3	<b>Pharmaceutical excipients</b>	a5	roles, types with examples	1	2
4	<b>Pharmaceutical dosage forms</b>	b2	the need to dosage forms, classification (according to physical form, route of administration, etc.)	1	2
5	<b>Old pharmaceutical dosage forms</b>	b3	Galenicals, mucilages, lozenges, cachets, pills, glycerites, etc.	1	2
<b>Mid-semester exam</b>				1	2
6	<b>Non-sterile Pharmaceutical solutions</b>	a3, a4, a5, b2, b3, b4, b5	definition of solutions, advantages, disadvantages, general method of preparation, enhancement of dissolution, excipients, types of waters	1	2
7	<b>Aqueous Pharmaceutical solutions</b>	a3, a4, a5, b2, b3, b4, b5	(aromatic waters, douches, mouthwashes, syrups, linctuses, non-syrup oral solutions, and enemas) :general characters advantages, disadvantages, method of preparation, purpose of each type.	1	2
8	<b>Non-Aqueous Pharmaceutical solutions</b>	a3, a4, a5, b2, b3, b4, b5	(concentrated water, spirits, elixirs, collodions, liniments, sprays, fluidextracts, tinctures), , method of preparation, purpose of each type, general characters	1	2



9	<b>Non-sterile liquid Dispersion systems</b>	a3, a4, a5, b2, b3, b4, b5	definition, difference from solutions, advantages, disadvantages. <ul style="list-style-type: none"> <li><b>Colloidals:</b> types, advantages, disadvantages, properties, examples.</li> <li><b>suspensions</b> definition, types, advantages, disadvantages, physical properties ( sedimentation, stability, flocculated, deflocculated, zeta-potential), excipients, method of preparation, examples</li> <li><b>emulsions</b> definition, types, advantages, disadvantages, physical stability, excipients, method of preparation, examples</li> <li><b>Microemulsions and nanoemulsion:</b> definition, types, advantages, disadvantages, physical stability, excipients, method of preparation, examples</li> </ul>	3	6
10	<b>Non-sterile Drops</b>	a3, a4, a5, b2, b3, b4, b5	definition, types, formulation requirements,	1	2
<b>Course Review</b>		a3, a4, a5, b2, b3, b4, b5	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	10 Units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Couse Intended Learning Outcomes CILOs</b>
1.	introduction to the Lab.: safety requirements, list of experiments, How to report, etc.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2.	Preparation of aqueous solutions : aromatic water (Pippermint water)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
3.	Preparation of aqueous solutions : mouthwash (boric acid M.W.)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4.	Preparation of aqueous solutions : Syrups (simple syryp.)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
5.	Preparation of aqueous solutions : cough Syrup (linctuses) (ammonium chloride syryp.)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
6.	Preparation of non-aqueous solutions : Elixirs (Aromatic elixir)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
7.	Preparation of non-aqueous solutions : liniments (camphor liniment)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
8.	Preparation of liquid dispersion systems : emulsions (castor oil emulsion)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
9.	Preparation of liquid dispersion systems : emulsions (liquid paraffin emulsion)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
10.	Preparation of liquid dispersion systems : suspensions (calamine lotion)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
11.	Review	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to present a search report supported with images on 5 trade names (commercial preparations) of the studied dosage forms	c5, c6, d4	4-13	3
2	<b>Group</b> :every group is assigned to present an illustrating videos on lab. And industrial preparation of 3 types of studies dosage forms.	c5, c6, d1, d4	14	2





VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, a5, b2, b3, b4, b5
2	Assignments (1 + 2)	4-13, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a5, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5, b2, b3, b4, b5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	



## VIII. Learning Resources

### 1- Required Textbook(s) ( maximum two ).

1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
2. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 2- Essential References.

1. Rawlins. Bentley s of text book of pharmaceutics
2. Kasture pharmaceutics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of PHARMACEUTICS I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course provides introduction to pharmaceutics as a science of dosage form design and also deals with the study of non-sterile liquid pharmaceutical preparations.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Identify the significance of pharmaceuticals and the need to pharmaceutical dosage forms.
2.		a2. Identify the reason and type of pharmaceutical incompatibilities frequently encountered during formulation of pharmaceutical dosage forms.
3.		a3. Explicit the general properties, advantages and disadvantages of pharmaceutical liquid dosage forms.
4.	A3	a4. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types pharmaceutical liquid dosage forms.
5.		a5. Explicit the types and roles of excipients included in different types of pharmaceutical liquid dosage forms.
6.	A4	a6. Comprehend his/her role as pharmacist in formulation of pharmaceutical dosage forms.
7.	B1	b1. Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a pharmaceutical formula.
8.	B2	b2 . Classify pharmaceutical dosage forms and categorize liquid dosage forms .
9.		b3. Compare between various types of pharmaceutical liquid dosage forms in particular between old and current dosage forms and between solutions and dispersion liquids.
10.		b4. Relate the selection of excipients and the method of preparation of pharmaceutical liquid dosage forms to formulation, compatibility and stability factors.
11.	B3	b5. Formulate the active ingredient and excipients into an appropriate pharmaceutical liquid dosage forms.
12.	B4	b6 . Assess the quality of the prepared pharmaceutical liquid dosage
13.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceuticals Lab.
14.		c2. Operate successfully the instruments used in pharmaceuticals Lab.
15.	C2	c3. Prepare successfully pharmaceutical liquid dosage forms using standard procedures.
16.	C3	c4 .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceuticals Lab.



17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. behave in discipline during practical works.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4. Demonstrate time management and self-learning skills during performing assignments and practical works.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture	Written exam , Attendance
a4, a5	Lecture	Written exam , Attendance
a6	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2, b3, b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to



<b>Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1, c2, c3, c4</b>	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
<b>c5</b>	Feed-back learning, Group-project	Assignments
<b>c6</b>	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d2, d3</b>	laboratory practice, Feed-back learning, group project	Practical assessment (Lab. attendance, attitude, practical exam), Assignments
<b>d4</b>	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) , Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1	definitions and brief history of pharmaceuticals, dosage forms, pharmacopeia, active ingredients, excipients.	1	2
2	<b>Compounded prescriptions</b>	a2	formula, incompatibilities, general operations (maceration, percolation, filtration, mixing, size-reducing, etc)	2	4
3	<b>Pharmaceutical excipients</b>	a5	roles, types with examples	1	2
4	<b>Pharmaceutical dosage forms</b>	b2	the need to dosage forms, classification (according to physical form, route of administration, etc.)	1	2
5	<b>Old pharmaceutical dosage forms</b>	b3	Galenicals, mucilages, lozenges, cachets, pills, glycerites, etc.	1	2
<b>Mid-semester exam</b>				1	2
6	<b>Non-sterile Pharmaceutical solutions</b>	a3, a4, a5, b2, b3, b4, b5	definition of solutions, advantages, disadvantages, general method of preparation, enhancement of dissolution, excipients, types of waters	1	2
7	<b>Aqueous Pharmaceutical solutions</b>	a3, a4, a5, b2, b3, b4, b5	(aromatic waters, douches, mouthwashes, syrups, linctuses, non-syrup oral solutions, and enemas) :general characters advantages, disadvantages, method of preparation, purpose of each type.	1	2
8	<b>Non-Aqueous Pharmaceutical solutions</b>	a3, a4, a5, b2, b3, b4, b5	(concentrated water, spirits, elixirs, collodions, liniments, sprays, fluidextracts, tinctures), , method of preparation, purpose of each type, general characters	1	2





9	<b>Non-sterile liquid Dispersion systems</b>	a3, a4, a5, b2, b3, b4, b5	definition, difference from solutions, advantages, disadvantages. <ul style="list-style-type: none"> <li><b>Colloidals:</b> types, advantages, disadvantages, properties , examples.</li> <li><b>suspensions</b> definition, types, advantages, disadvantages, physical properties ( sedimentation, stability, flocculated, deflocculated, zeta-potential), excipients, method of preparation, examples</li> <li><b>emulsions</b> definition, types, advantages, disadvantages, physical stability, excipients, method of preparation, examples</li> <li><b>Microemulsions and nanoemulsion:</b> definition, types, advantages, disadvantages, physical stability, excipients, method of preparation, examples</li> </ul>	3	6
10	<b>Non-sterile Drops</b>	a3, a4, a5, b2, b3, b4, b5	definition, types, formulation requirements,	1	2
<b>Course Review</b>		a3, a4, a5, b2, b3, b4, b5	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	10 Units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Couse Intended Learning Outcomes CILOs</b>
1.	introduction to the Lab.: safety requirements, list of experiments, How to report, etc.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2.	Preparation of aqueous solutions : aromatic water (Pippermint water)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
3.	Preparation of aqueous solutions : mouthwash (boric acid M.W.)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4.	Preparation of aqueous solutions : Syrups (simple syryp.)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
5.	Preparation of aqueous solutions : cough Syrup (linctuses) (ammonium chloride syryp.)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
6.	Preparation of non-aqueous solutions : Elixirs (Aromatic elixir)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
7.	Preparation of non-aqueous solutions : liniments (camphor liniment)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
8.	Preparation of liquid dispersion systems : emulsions (castor oil emulsion)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
9.	Preparation of liquid dispersion systems : emulsions (liquid paraffin emulsion)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
10.	Preparation of liquid dispersion systems : suspensions (calamine lotion)	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
11.	Review	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to present a search report supported with images on 5 trade names (commercial preparations) of the studied dosage forms	c5, c6, d4	4-13	3
2	<b>Group</b> :every group is assigned to present an illustrating videos on lab. And industrial preparation of 3 types of studies dosage forms.	c5, c6, d1, d4	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, a5, b2, b3, b4, b5
2	Assignments (1 + 2)	4-13, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a5, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5, b2, b3, b4, b5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	



## VIII. Learning Resources

### 1- Required Textbook(s) ( maximum two ).

1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
2. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 2- Essential References.

1. Rawlins. Bentley s of text book of pharmaceutics
2. Kasture pharmaceutics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACEUTICS II

I. Course Identification and General Information:							
1.	Course Title:	PHARMACEUTICS II					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( SECOND ) Year – ( SECOND) semester					
5.	Pre –requisite (if any):	Pharmaceutics I					
6.	Co –requisite (if any):	None					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

II. Course Description:
<p>The course deals with the study of pharmaceutical aerosols, semisolid and suppositories.</p> <p>The course also deals with powders and granules as an introduction to tablets and capsules solid dosage forms.</p>



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the general properties, advantages and disadvantages of pharmaceutical aerosols, semisolid , suppositories, powders and granules.
2.	A3	a2. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types pharmaceutical aerosols, semisolid , suppositories, powders and granules.
3.		a3. Explicit the types and roles of excipients included in different types of pharmaceutical aerosols, semisolid , suppositories, powders and granules.
4.	A4	a4. Comprehend his/her role as pharmacist in formulation of pharmaceutical dosage forms.
5.	B1	b1. Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a pharmaceutical formula.
6.	B2	b2 .Categorize pharmaceutical aerosols, semisolid , suppositories, powders and granules.
7.		b3. Compare between various types of pharmaceutical aerosols, semisolid , suppositories, powders and granules.
8.	B3	b4. Relate the selection of excipients and the method of preparation of pharmaceutical aerosols, semisolid , suppositories, powders and granules to formulation, compatibility and stability factors.
9.		b5. Formulate the active ingredient and excipients into an appropriate pharmaceutical aerosols, semisolid , suppositories, powders and granules.
10.	B4	b6 . Assess the quality of the prepared pharmaceutical semisolid , suppositories, powders and granules.
11.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceuticals Lab.
12.		c2. Operate successfully the instruments used in pharmaceuticals Lab.
13.	C2	c3. Prepare successfully pharmaceutical liquid dosage forms using standard procedures.
14.	C3	c4 .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceuticals Lab.
15.	C4	c5 .Search efficiently for information using documented and electronic





		sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Work successfully in team-work.
18.	D2	d2. Behave in discipline during practical works.
19.	D3	d3. Communicate effectively with his/her colleagues
20.	D4	d4. Demonstrate time management and self-learning skills during performing assignments and practical works.

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2, a3	Lecture	Written exam , Attendance
a4	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2, b3, b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		



Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning, Group-project	Assignments
c6	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	laboratory practice, Feed-back learning, group project	Practical assessment (Lab. attendance, attitude, practical exam), Assignments
d4	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) , Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Pharmaceutical aerosols</b>	a1, a2, a3, b2, b3, b4, b5	Definition , advantages, disadvantages, types of aerosols, anatomical features of the bronchi, Pressurized packages (Type of propellants , Containers , Formulation aspects, Air-blast nebulizers), methods of preparation (pressurized filling, cold filling), quality control evaluation	2	4
2	<b>Pharmaceutical semisolid dosage forms</b>	a1, a2, a3, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>• <b>introduction:</b> definitions , advantages, disadvantages, types, anatomical features and targets of the skin,</li> <li>• <b>ointments</b> (definitions, advantages, advantages, disadvantages, classification based on type of ointment base, formulation considerations, method of preparation)</li> <li>• <b>Pastes:</b> (definitions, advantages, advantages, disadvantages, classification based on type of ointment base,</li> <li>• <b>Creams</b> (definitions, advantages, advantages, disadvantages,</li> <li>• classification, formulation considerations, method of preparation</li> <li>• <b>Gels</b> (definitions, advantages, classification, formulation , considerations, method of preparation</li> </ul>	4	8
<b>Mid-semester exam</b>				1	2
3	<b>Suppositories</b>	a1, a2, a3, b2, b3, b4, b5	definitions, advantages, advantages, disadvantages, classification (rectal, vaginal) formulation, types of suppository bases, method of preparation	2	4



4	<b>Pharmaceutical solid dosage forms (Powders)</b>	a1, a2, a3, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>○ Definitions, advantages, disadvantages</li> <li>○ classification (coarse, fine, microfine, etc; divided, bulk; compounded; medicated, cosmetic)</li> <li>○ Formulation considerations (characters of ingredients morphology, flowability, stability, particle size, compatibility)</li> <li>○ Comminuting and Blending of powders Bulk and divided powders: formulation, examples</li> <li>○ Dusting powder: formulation, examples</li> <li>○ Powders packaging: folding in papers</li> <li>○ Quality control evaluation : evaluation of mixing, flowability, water content, assay, stability, etc.</li> </ul>	3	6
5	<b>Pharmaceutical solid dosage forms (Granules)</b>	a1, a2, a3, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>○ Definition, advantages, disadvantages</li> <li>○ Method of preparation</li> <li>○ Formulation considerations (characters of ingredients morphology, flowability, stability, particle size, compatibility)</li> </ul> <b>Effervescent granules</b> <ul style="list-style-type: none"> <li>○ Definition, composition</li> <li>○ Method of preparation: dry (fusion) method, wet method</li> <li>○ Determination of the required quantity of sodium bicarbonate, tartaric acid and citric acid in the formulation</li> </ul>	2	4
<b>Course Review</b>		a1, a2, a3, b2, b3, b4, b5	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Couse Intended Learning Outcomes CILOs</b>
1.	Pharmaceutical aerosols: construction and use	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2.	Preparation of salicylic acid 2 % ointment in simple ointment base	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
3.	Preparation of hydrophilic ointment USP	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4.	Preparation of Polyethylene glycol ointment base.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
5.	Preparation of o/ w creams: vanishing cream base	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
6.	Preparation of w/o creams: cold cream base	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
7.	Preparation of hydrophilic gel base : Carbomer or Carboxymethyl cellulose gel	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
8.	Preparation of Aspirin in cocoa butter base suppositories.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
9.	Preparation of Glycerin suppositories.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
10.	Preparation of Dusting powders	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
11.	Preparation of Effervescent base granules	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.</p> <p>The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to present a search report supported with images on 5 trade names (commercial preparations) of the studied dosage forms	c5, c6, d4	4-13	3
2	<b>Group</b> :every group is assigned to present an illustrating videos on lab. And industrial preparation of 3 types of studies dosage forms.	c5, c6, d1, d4	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b2, b3, b4, b5
2	Assignments (1 + 2)	4, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a3, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b2, b3, b4, b5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	





## VIII. Learning Resources

### 1- Required Textbook(s) ( maximum two ).

1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
2. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 2- Essential References.

1. Rawlins. Bentley s of text book of pharmaceutics
2. Kasture pharmaceutics
3. Raje. pharmaceutics
4. Raph. practical pharmaceutics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of PHARMACEUTICS II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

III. Course Description:
<p>The course deals with the study of pharmaceutical aerosols, semisolid and suppositories.</p> <p>The course also deals with powders and granules as an introduction to tablets and capsules solid dosage forms.</p>



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the general properties, advantages and disadvantages of pharmaceutical aerosols, semisolid , suppositories, powders and granules.
2.	A3	a2. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types pharmaceutical aerosols, semisolid , suppositories, powders and granules.
3.		a3. Explicit the types and roles of excipients included in different types of pharmaceutical aerosols, semisolid , suppositories, powders and granules.
4.	A4	a4. Comprehend his/her role as pharmacist in formulation of pharmaceutical dosage forms.
5.	B1	b1. Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a pharmaceutical formula.
6.	B2	b2 .Categorize pharmaceutical aerosols, semisolid , suppositories, powders and granules.
7.		b3. Compare between various types of pharmaceutical aerosols, semisolid , suppositories, powders and granules.
8.	B3	b4. Relate the selection of excipients and the method of preparation of pharmaceutical aerosols, semisolid , suppositories, powders and granules to formulation, compatibility and stability factors.
9.		b5. Formulate the active ingredient and excipients into an appropriate pharmaceutical aerosols, semisolid , suppositories, powders and granules.
10.	B4	b6 . Assess the quality of the prepared pharmaceutical semisolid , suppositories, powders and granules.
11.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceuticals Lab.
12.		c2. Operate successfully the instruments used in pharmaceuticals Lab.
13.	C2	c3. Prepare successfully pharmaceutical liquid dosage forms using standard procedures.
14.	C3	c4 .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceuticals Lab.
15.	C4	c5 .Search efficiently for information using documented and electronic



		sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Work successfully in team-work.
18.	D2	d2. Behave in discipline during practical works.
19.	D3	d3. Communicate effectively with his/her colleagues
20.	D4	d4. Demonstrate time management and self-learning skills during performing assignments and practical works.

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2, a3	Lecture	Written exam , Attendance
a4	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2, b3, b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		



Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning, Group-project	Assignments
c6	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	laboratory practice, Feed-back learning, group project	Practical assessment (Lab. attendance, attitude, practical exam), Assignments
d4	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) , Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Pharmaceutical aerosols</b>	a1, a2, a3, b2, b3, b4, b5	Definition , advantages, disadvantages, types of aerosols, anatomical features of the bronchi, Pressurized packages (Type of propellants , Containers , Formulation aspects, Air-blast nebulizers), methods of preparation (pressurized filling, cold filling), quality control evaluation	2	4
2	<b>Pharmaceutical semisolid dosage forms</b>	a1, a2, a3, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>• <b>introduction:</b> definitions , advantages, disadvantages, types, anatomical features and targets of the skin,</li> <li>• <b>ointments</b> (definitions, advantages, advantages, disadvantages, classification based on type of ointment base, formulation considerations, method of preparation)</li> <li>• <b>Pastes:</b> (definitions, advantages, advantages, disadvantages, classification based on type of ointment base,</li> <li>• <b>Creams</b> (definitions, advantages, advantages, disadvantages,</li> <li>• classification, formulation considerations, method of preparation</li> <li>• <b>Gels</b> (definitions, advantages, classification, formulation , considerations, method of preparation</li> </ul>	4	8
<b>Mid-semester exam</b>				1	2
3	<b>Suppositories</b>	a1, a2, a3, b2, b3, b4, b5	definitions, advantages, advantages, disadvantages, classification (rectal, vaginal) formulation, types of suppository bases, method of preparation	2	4



4	<b>Pharmaceutical solid dosage forms (Powders)</b>	a1, a2, a3, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>○ Definitions, advantages, disadvantages</li> <li>○ classification (coarse, fine, microfine, etc; divided, bulk; compounded; medicated, cosmetic)</li> <li>○ Formulation considerations (characters of ingredients morphology, flowability, stability, particle size, compatibility)</li> <li>○ Comminuting and Blending of powders Bulk and divided powders: formulation, examples</li> <li>○ Dusting powder: formulation, examples</li> <li>○ Powders packaging: folding in papers</li> <li>○ Quality control evaluation : evaluation of mixing, flowability, water content, assay, stability, etc.</li> </ul>	3	6
5	<b>Pharmaceutical solid dosage forms (Granules)</b>	a1, a2, a3, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>○ Definition, advantages, disadvantages</li> <li>○ Method of preparation</li> <li>○ Formulation considerations (characters of ingredients morphology, flowability, stability, particle size, compatibility)</li> </ul> <b>Effervescent granules</b> <ul style="list-style-type: none"> <li>○ Definition, composition</li> <li>○ Method of preparation: dry (fusion) method, wet method</li> <li>○ Determination of the required quantity of sodium bicarbonate, tartaric acid and citric acid in the formulation</li> </ul>	2	4
<b>Course Review</b>		a1, a2, a3, b2, b3, b4, b5	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units





<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Couse Intended Learning Outcomes CILOs</b>
1.	Pharmaceutical aerosols: construction and use	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2.	Preparation of salicylic acid 2 % ointment in simple ointment base	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
3.	Preparation of hydrophilic ointment USP	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4.	Preparation of Polyethylene glycol ointment base.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
5.	Preparation of o/ w creams: vanishing cream base	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
6.	Preparation of w/o creams: cold cream base	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
7.	Preparation of hydrophilic gel base : Carbomer or Carboxymethyl cellulose gel	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
8.	Preparation of Aspirin in cocoa butter base suppositories.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
9.	Preparation of Glycerin suppositories.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
10.	Preparation of Dusting powders	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
11.	Preparation of Effervescent base granules	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.</p> <p>The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to present a search report supported with images on 5 trade names (commercial preparations) of the studied dosage forms	c5, c6, d4	4-13	3
2	<b>Group</b> :every group is assigned to present an illustrating videos on lab. And industrial preparation of 3 types of studies dosage forms.	c5, c6, d1, d4	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b2, b3, b4, b5
2	Assignments (1 + 2)	4, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a3, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b2, b3, b4, b5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	



## VIII. Learning Resources

### 1- Required Textbook(s) ( maximum two ).

1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
2. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 2- Essential References.

1. Rawlins. Bentley s of text book of pharmaceutics
2. Kasture pharmaceutics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course specification of: Physiology II

1.	Course Title :					Physiology II
2.	Course Code and Number:					
3.	Lecture	Training	Practical	Seminar/ Tutorial	Total	Credit Hours: 2
	2	-	-	-	2	
4.	Study Level and Semester:					Second Year –Second Semester
5.	Pre-requisites (if any):					Physiology I
6.	None Co-requisites (if any):					None
7.	Program in which the course is offered:					Bachelor of Pharmacy
8.	Teaching Language:					English
9.	Study System:					Obligatory attendance
10.	Prepared by					
11.	Location of teaching the course:					Yemen University
12.	Date of Approval :					2015
13.	Approved by:					

### I. Course Description :

This course is designed to study the regulatory and functional aspects of the human body organs or systems such as cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems.

### II. Course Aims :

Upon completion this course the student will be able to :

1. Understand the regulatory and functional role for each one of the human body organs or systems.
2. Know the relative and coordinating functional aspects between the different body systems.
3. Recognize the mechanisms by which regulatory and functional roles of all human system are taking place.

Alignment CILOs to PILOs		
PILOs	ILCOs	٢
<b>A1</b>	a1. Discuss the concept of homeostasis and feedback mechanisms observed in normal functions of human body organs.	<b>a1</b>
	a2. Determine the normal functions and regulations of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems	<b>a2</b>
<b>A2</b>	a3. Explain the biological role of certain endogenous substances in regulation the normal functions of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems.	<b>a3</b>
<b>B1</b>	b1. Identify the signs of normal functions of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems.	<b>b1</b>
	b2. Interpret the of normal function outcomes of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems.	<b>b2</b>
<b>B2</b>	b3. Classify the regulatory and functional aspects of the human body systems according to the physiological importance.	<b>b3</b>
	b4. Compare physiologically between the cardiovascular, respiratory, digestive, renal, reproductive, blood and lymphatic systems with each other .	<b>b4</b>
<b>B3</b>	b5 .Relate the normal functions of the cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems to their affecting factors.	<b>b5</b>
<b>B4</b>	b6. Assess the normal functions of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems.	<b>b6</b>
<b>C4</b>	c1. Present his/her thoughts , search for information and report works effectively using appropriate references books , internet and technologies media.	<b>c1</b>
<b>D1</b>	d1. Share successfully in team-work.	<b>d1</b>
<b>D2</b>	d2. Show respect for life and commitment to his/her colleagues.	<b>d2</b>

<b>1- Intended Learning Outcomes of Course ( ILCOs ) :</b>	
<b>Knowledge and Understanding:</b>	
<b>Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)</b>	
<b>Knowledge and Understanding CILOs</b>	<b>Knowledge and Understanding PILOs</b>

After completing this course, students would be able to:	After completing this program, students would be able to:	
a1. Discuss the concept of homeostasis and feedback mechanisms observed in normal functions of human body organs.	Understand the current missions, duties and carriers of pharmacists as professionals and the related pharmaceutical sciences and the historical progress of the profession.	A1
a2. Determine the normal functions and regulations of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems		
a3. Explain the biological role of certain endogenous substances in regulation the normal functions of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems	Know the structures and biological processes & functions of different parts in living organisms including those in human body& sources/causes and mechanisms of diseases.	A2

Intellectual Skills:		
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)		
Intellectual Skills CILOs	Intellectual Skills PILOs	
After completing this course, students would be able to:	After completing this program, students would be able to:	
b1. Identify the signs of normal functions of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems.	Use various logic mental processes such as calculation, explanation, description, conclusion, and others in dealing with various phenomena/problems related to pharmacy works.	B1
b2. Interpret the of normal function outcomes of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems.		
b3. Classify the regulatory and functional aspects of the human body systems according to the physiological importance.	Compare, differentiate and distinguish between related entities, phenomena and concepts and classify various entities based on certain properties.	B2
b4. Compare physiologically between the cardiovascular, respiratory, digestive, renal, reproductive, blood and lymphatic systems with each other .		
b5 .Relate the normal functions of the cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems to their affecting factors.	Bind phenomena, laws or equations to their affecting factors. In addition, how these change by enhancing or inhibiting of such factors.	B3
b6. Assess the normal functions of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems	Determine the source of errors/problems and work to solve them.	B4

Professional and Practical Skills:
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Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)		
Professional and Practical Skills CILOs	Professional and Practical Skills PILOs	
After completing this course, students would be able to:	After completing this program, students would be able to:	
c1. Present his/her thoughts , search for information and report works effectively using appropriate references books , internet and technologies media.	Effectively & correctly use language grammars & fundamental skills (reading, writing and speech) , and the media and information sources (books, internet websites, computer programs) to present thoughts/ideas and to search for information	C4

Transferable (General) Skills :		
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)		
Transferable (General) Skills CILOs	Transferable (General) Skills PILOs	
After completing this course, students would be able to:	After completing this program, students would be able to:	
d1. Share successfully in team-work.	Share successfully in teamwork& reporting activities.	D1
d2. Show respect for life and commitment to his/her colleagues.	Show respect to life and commit to community serving.	D2

2- Alignment of CILOs to Teaching and Assessment Strategies		
First: Alignment of Knowledge and Understanding with the CILOs		
Assessment Strategies	Teaching Strategies	Knowledge and Understanding ILCOs

<ul style="list-style-type: none"> <li>• Assignments,</li> <li>• Class room participation</li> <li>• Quizzes</li> <li>• Homework,</li> <li>• Mid-term exam.</li> <li>• Final Exam.</li> <li>• Graduation project</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Seminars</li> <li>• Brainstorming,</li> <li>• Group Discussion</li> </ul>	<p>a1. Discuss the concept of homeostasis and feedback mechanisms observed in normal functions of human body organs.</p> <p>a2. Determine the normal functions and regulations of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems</p> <p>a3. Explain the biological role of certain endogenous substances in regulation the normal functions of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems.</p>
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## Second: Alignment of Intellectual Skills with the CILOs

Assessment Strategies	Teaching Strategies	Intellectual Skills CILOs
<ul style="list-style-type: none"> <li>• Assignments,</li> <li>• Class room participation</li> <li>• Quizzes</li> <li>• Homework,</li> <li>• Mid-term exam.</li> <li>• Final Exam.</li> <li>• Graduation project</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures,</li> <li>• Seminars</li> <li>• Brainstorming,</li> <li>• Group discussion</li> </ul>	<p>b1. Identify the signs of normal functions of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems.</p> <p>b2. Interpret the of normal function outcomes of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems.</p> <p>b3. Classify the regulatory and functional aspects of the human body systems according to the physiological importance .</p> <p>b4. Compare physiologically between the cardiovascular, respiratory, digestive, renal, reproductive, blood and lymphatic systems with each other.</p> <p>b5 .Relate the normal functions of the cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems to their affecting factors.</p> <p>b6. Assess the normal functions of cardiovascular , respiratory , digestive, renal , reproductive, blood and lymphatic systems.</p>

## Third: Alignment of Professional and Practical Skills with the CILOs

Assessment Strategies	Teaching Strategies	Professional and Practical Skills CILOs
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<ul style="list-style-type: none"> <li>• Assignments,</li> <li>• Class room participation</li> <li>• Quizzes</li> <li>• Homework,</li> <li>• Mid-term exam.</li> <li>• Final Exam.</li> <li>• Graduation project</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures .</li> <li>• Seminars</li> <li>• Brainstorming,</li> <li>• Group discussion</li> </ul>	c1. Present his/her thoughts , search for information and report works effectively using appropriate references books , internet and technologies media.
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Fourth: Alignment of Transferable (General) Skills with the CILOs		
Assessment Strategies	Teaching Strategies	Transferable (General) Skills CILOs
<ul style="list-style-type: none"> <li>• Assignments,</li> <li>• Class room participation</li> <li>• Quizzes</li> <li>• Homework,</li> <li>• Mid-term exam.</li> <li>• Final Exam.</li> <li>• Graduation project</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures .</li> <li>• Seminars</li> <li>• Brainstorming,</li> <li>• Group discussion</li> </ul>	<p>d1. Share successfully in team-work.</p> <p>d2. Show respect for life and commitment to his/her colleagues.</p>

No.	Course Topics/Units	Sub-topics	No. of Weeks	Contact hours	CILOs
1	Cardiovascular system	<ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Cardiac conductive system.</li> <li>• Stroke volume, heart rate, cardiac output.</li> <li>• Blood pressure (B. P).</li> <li>• Action of autonomic N.S on C.V.S.</li> <li>• Endocrine actions on C.V.S.</li> <li>• Mechanism of B.P control</li> </ul>	2	4	a3, a4, b4, b5, b6,d1, d2
2	Respiratory system	<ul style="list-style-type: none"> <li>• Function of the nose.</li> <li>• Function of the paranasal sinuses.</li> <li>• Function of the larynx.</li> <li>• Mechanism of breathing.</li> <li>• Gas – exchange.</li> <li>• Control of respiration</li> </ul>	2	4	a3, a4, b4, b5, b6,d1, d2
3	Digestive system	<ul style="list-style-type: none"> <li>• Mastication.</li> <li>• Deglutition.</li> <li>• Deceptions (saliva, gastric, bile fat).</li> <li>• Absorption.</li> <li>• Motility.</li> <li>• Defecation.</li> <li>• Nervous control on GIT.</li> <li>• Endocrine control on GIT.</li> </ul>	3	6	a3, a4, b4, b5, b6,d1, d2
	Midterm exam.		1	2	
4	Renal system	<ul style="list-style-type: none"> <li>• Formation of urine.</li> <li>• Acid base balance.</li> <li>• Micturation</li> </ul>	2	4	a3, a4, b4, b5, b6,d1, d2
5	Reproductive system	<ul style="list-style-type: none"> <li>• Spermatogenesis.</li> <li>• Oogenesis.</li> <li>• Ovarian cycle.</li> <li>• Menstrual cycle</li> </ul>	2	4	a3, a4, b4, b5, b6,d1, d2
6	Blood and lymphatic system	<ul style="list-style-type: none"> <li>• Haemopoiesis and erythropoiesis.</li> <li>• Blood coagulation</li> <li>• Lymph, thymus , and Lymph nodes functions.</li> </ul>	2	4	a3, a4, b4, b5, b6,d1, d2
Revision			1	2	
Final exam			1	2	

Total number of weeks and hours	16	32	
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## I. Teaching Strategies

- **Lecture:** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom  
The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming:** It depends on stimulation of the student's brain through a group of questions &/or **Concepts map:** which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- **Feed-back learning:** students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation.
- **Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills.

## II. Tasks and Assignments :

No.	Task/Assignment	CILOs	Week due	Mark
1	<b>Individual:</b> every student is assigned to do a search on one endogenous mediator that is involved in one of the physiological studied and provide a summary report on it.	a3, c1, d1	6	4-13
2	<b>Group :</b> each group of students will be assigned todo a search on one of the physiological processes studied and make a summary report.	a4, c1	4	14

## III. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course (CILOs)
1	Attendance	1 - 15	5	5 %	a1, a2, a3, a4, b4, b5, b6,c1, d1, d2
2	Assignments (1 + 2)	4, 14	10	10 %	a3, a4, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5 %	b3, b4, b5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20 %	a1, a2, a3, a4, b4, b5, b6,c1, d1, d2
5	Final exam of theoretical part ( written exam)	17	60	60 %	a1, a2, a3, a4, b4, b5, b6,c1, d1, d2

TOTAL	100	100 %	
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#### Essential References-not less than 4

1. C.C.Chatterjee. Human physiology
2. Laurie kelly . Essential of human physiology for pharmacy, 2004, CRC press
3. Hassan Hamdi, Fundamentals of human physiology
4. Salah Abu-Sitta , Synopsis of medical physiology
5. W. F. Ganong. Review of medical physiology

V.	IV. Course Policies:
1	<b>Class Attendance:</b> Student should attend at least 75% of the total contact hours of the subject; otherwise he/she will not be allowed to sit for the course exam and will be considered as exam failure. If the student's absence repeated due to illness, he/she will be demanded to provide a definite proof from the university Clinic. If the student's absence rate is above 25% of the course total contact hours without a reasonable excuse, he/she will be notified to study the entire course again.
2	<b>Tardiness:</b> Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course according the university regulations.
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules
7	<b>Other policies:</b> <ul style="list-style-type: none"> <li>- The mobile is not allowed to be used during the lecture. It must be turned off, otherwise the student will be asked to leave the lecture room.</li> <li>- The mobile is not allowed to be taken to the exam hall.</li> <li>- Lecture notes and assignments may be given directly to students using soft or hard copy.</li> <li>- Students should familiarize themselves with all University and College Policies that cover students' rights, responsibilities and the Academic Appeal process.</li> </ul>







## Course Specification

### PHYSIOLOGY I

I. Course Identification and General Information:					
1.	Course Title:	PHYSIOLOGY I			
2.	Course Code & Number:				
3.	Credit hours:	C.H			TOTAL
		Theoretical		P.	
		L.	Tut.	S.	
		2	-	-	2
4.	Study level/ semester at which this course is offered:	( 2nd ) Year – ( FIRST ) semester			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General biology</li> </ul>			
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>Anatomy</li> <li>histology</li> </ul>			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10.	Prepared By:				
11.	Date of Approval	2015			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course concerns with study of cell repair mechanism, transport mechanism through cell membrane, body fluids , acid-base balance as well as with functions and regulation of organs of the nervous system, endocrine and skeletal system.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Discuss the concept of homeostasis and feedback mechanisms observed in normal functions of human body organs.
2.		a2. . Identify the mechanisms of transport of material into and out of human cells.
3.		a3. Determine the normal functions and regulation of nervous system, endocrine glands and muscles.
4.	A2	a4. Explain the biological role of certain endogenous substances in regulation the normal functions of nervous system, endocrine glands and muscles.
5.	B1	b1. Identify the signs of normal functions of nervous system, endocrine glands and muscles.
6.		b2. Interpret the outcomes of normal functions of nervous system, endocrine glands and muscles.
7.	B2	b3. Classify neurotransmitters and hormones physiologically.
8.		b4. Compare physiologically between different types of nervous system, endocrine glands and muscles.
9.	B3	b5 .Relate the normal functions in nervous system, endocrine glands and muscles to their affecting factors.
10.	B4	b6 . Assess the normal functions of nervous system, endocrine glands and muscles
11.	C4	c1. Present his/her thoughts , search for information and report works effectively using appropriate references books , internet and technologies media
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture,, laboratory practice	written exam , , assignment
a4	Lecture, feed-back learning	written exam , assignment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Feed-back learning, Group-project.	Written exam
b3, b4	Lecture, , feed-back learning	written exam , quizzes
b5	Lecture, feed-back learning	written exam, quizzes
b6	Lecture	written exam

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Feed-back learning ,Group-project.	assignment

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project ,, feed-back learning	Assignment
d2	lecture	Written exam



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b4, b5	physiology definition, the concept of homeostasis. Negative feedback.	1	2
2	<b>The Cell and body fluids physiology</b>	a2, a4, b1, b2, b4, b5, d1, d2	<ul style="list-style-type: none"> <li>• structure, functions, membrane transport mechanisms: (passive diffusion, mediated transport, osmosis)</li> <li>• membrane potential (resting, action)</li> <li>• Cell repair : mechanisms.</li> <li>• Composition and regulations of Body fluids, electrolytes and acid-base balance</li> </ul>	2	4
3	<b>The Nervous system</b>	a3, a4, b4, b5, b6, d1, d2	<ul style="list-style-type: none"> <li>• Classification of nervous system</li> <li>• classes of neurons</li> <li>• Synaptic transmission (chemical synapsis, summation, interconnection between neurons, factors affecting the transmission)</li> </ul>	1	2
4	<b>Central nervous system (CNS) Part (1)</b>	a3, a4, b4, b5, b6, d1, d2	<ul style="list-style-type: none"> <li>• Components of CNS</li> <li>• level of CNS functions</li> <li>• functions of brain composition (cerebrum, cerebral cortex, etc. ),</li> <li>• blood brain barrier</li> <li>• spinal cord (function, composition, spinal reflex, cerebrospinal fluid)</li> </ul>	2	4
<b>MID-TERM EXAM</b>				1	2
4	<b>Central nervous system (CNS) Part (2)</b>	a3, a4, b4, b5, b6, d1, d2	<ul style="list-style-type: none"> <li>• Sensation: nociception, hyperalgesia, pain pathway, neurotransmitters of pain, types of pain (cutaneous, visceral, deep, , referred, phantom), endogenous analgesic system</li> <li>• Regulating areas in brain</li> </ul>	2	4



			(function, neurotransmitters) : nociception area, psychic area, heat regulating center, area controlling muscles relaxation and contraction vasomotor center, Chemoreceptor trigger zone and other areas involved in diseases.		
5	<b>Autonomic nervous system</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>definition and composition &amp; regulation</li> <li>sympathetic system (functions, neurotransmitters, receptors), adrenal medulla ,</li> <li>parasympathetic system (functions, neurotransmitters, receptors)</li> </ul>	2	4
6	<b>Endocrine system</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>hormones (biochemical classification, transport, mechanism of actions)</li> <li>functions and regulation of</li> <li>hormones of (pituitary gland, thyroid gland, parathyroid gland, pancreas, sex organs)</li> </ul>	2	4
7	<b>Muscles</b>	a3, a4, b4, b5, b6,d1, d2	<ul style="list-style-type: none"> <li>types , functions</li> <li>factors affecting contraction and relaxation</li> </ul>	1	2
<b>Course Review</b>		a3, a4, b4, b5, b6,d1, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.  
The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search on one endogenous mediator that is involved in one of the physiological studied and provide a summary report on it.	a3, c1, d1	4-13	6
2	<b>Group</b> : each group of students will be assigned to do a search on one of the physiological processes studied and make a summary report.	a4, c1	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b4, b5, b6, c1, d1, d2
2	Assignments (1 + 2)	4, 14	10	10	a3, a4, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b4, b5
4	Mid-semester exam of theoretical part (written exam)	7	20	20	a1, a2, a3, a4, b4, b5, b6, c1, d1, d2
5	Final exam of theoretical part (written exam)	17	60	60	a1, a2, a3, a4, b4, b5, b6, c1, d1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. C.C.Chatterjee. Human physiology
2. Laurie kelly . Essential of human physiology for pharmacy, 2004, CRC press

### 2- Essential References.

1. Hassan Hamdi, Fundamentals of human physiology
2. Salah Abu-Sitta , Synopsis of medical physiology
3. W. F. Ganong. Review of medical physiology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)





## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of PHYSIOLOGY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course concerns with study of cell repair mechanism, transport mechanism through cell membrane, body fluids , acid-base balance as well as with functions and regulation of organs of the nervous system, endocrine and skeletal system.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Discuss the concept of homeostasis and feedback mechanisms observed in normal functions of human body organs.
2.		a2. . Identify the mechanisms of transport of material into and out of human cells.
3.		a3. Determine the normal functions and regulation of nervous system, endocrine glands and muscles.
4.	A2	a4. Explain the biological role of certain endogenous substances in regulation the normal functions of nervous system, endocrine glands and muscles.
5.	B1	b1. Identify the signs of normal functions of nervous system, endocrine glands and muscles.
6.		b2. Interpret the outcomes of normal functions of nervous system, endocrine glands and muscles.
7.	B2	b3. Classify neurotransmitters and hormones physiologically.
8.		b4. Compare physiologically between different types of nervous system, endocrine glands and muscles.
9.	B3	b5 .Relate the normal functions in nervous system, endocrine glands and muscles to their affecting factors.
10.	B4	b6 . Assess the normal functions of nervous system, endocrine glands and muscles
11.	C4	c1. Present his/her thoughts , search for information and report works effectively using appropriate references books , internet and technologies media
12.	D1	d1. Share successfully in team-work.
13.	D2	d2. Show respect to life.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture,, laboratory practice	written exam , , assignment
a4	Lecture, feed-back learning	written exam , assignment

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Feed-back learning , Group-project.	Written exam
b3, b4	Lecture, , feed-back learning	written exam , quizzes
b5	Lecture, feed-back learning	written exam, quizzes
b6	Lecture	written exam

### (c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Feed-back learning ,Group-project.	assignment

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project , , feed-back learning	Assignment
d2	lecture	Written exam



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b4, b5	physiology definition, the concept of homeostasis. Negative feedback.	1	2
2	<b>The Cell and body fluids physiology</b>	a2, a4, b1, b2, b4, b5, d1, d2	<ul style="list-style-type: none"> <li>• structure, functions, membrane transport mechanisms: (passive diffusion , mediated transport, osmosis)</li> <li>• membrane potential(resting, action)</li> <li>• Cell repair : mechanisms.</li> <li>• Composition and regulations of Body fluids, electrolytes and acid-base balance</li> </ul>	2	4
3	<b>The Nervous system</b>	a3, a4, b4, b5, b6, d1, d2	<ul style="list-style-type: none"> <li>• Classification of nervous system</li> <li>• classes of neurons</li> <li>• Synaptic transmission ( chemical synapsis, summation, interconnection between neurons, factors affecting the transmission)</li> </ul>	1	2
4	<b>Central nervous system (CNS) Part (1)</b>	a3, a4, b4, b5, b6, d1, d2	<ul style="list-style-type: none"> <li>• Components of CNS</li> <li>• level of CNS functions</li> <li>• functions of brain composition (cerebrum, cerebral cortex, etc. ),</li> <li>• blood brain barrier</li> <li>• spinal cord (function, composition, spinal reflex, cerebrospinal fluid)</li> </ul>	2	4
<b>MID-TERM EXAM</b>				1	2
4	<b>Central nervous system (CNS) Part (2)</b>	a3, a4, b4, b5, b6, d1, d2	<ul style="list-style-type: none"> <li>• Sensation: nociception, hyperalgesia, pain pathway, neurotransmitters of pain, types of pain (cutaneous, visceral, deep, , referred , phantom) , endogenous analgesic system</li> </ul>	2	4



			<ul style="list-style-type: none"> <li>Regulating areas in brain (function, neurotransmitters) : nociception area, psychic area, heat regulating center, area controlling muscles relaxation and contraction vasomotor center, Chemoreceptor trigger zone and other areas involved in diseases.</li> </ul>		
5	<b>Autonomic nervous system</b>	a3, a4, b4, b5, b6, d1, d2	<ul style="list-style-type: none"> <li>definition and composition &amp; regulation</li> <li>sympathetic system (functions, neurotransmitters, receptors), adrenal medulla ,</li> <li>parasympathetic system (functions, neurotransmitters, receptors)</li> </ul>	2	4
6	<b>Endocrine system</b>	a3, a4, b4, b5, b6, d1, d2	<ul style="list-style-type: none"> <li>hormones (biochemical classification, transport, mechanism of actions)</li> <li>functions and regulation of</li> <li>hormones of (pituitary gland, thyroid gland, parathyroid gland, pancreas, sex organs)</li> </ul>	2	4
7	<b>Muscles</b>	a3, a4, b4, b5, b6, d1, d2	<ul style="list-style-type: none"> <li>types , functions</li> <li>factors affecting contraction and relaxation</li> </ul>	1	2
<b>Course Review</b>		a3, a4, b4, b5, b6, d1, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	7 Units



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search on one endogenous mediator that is involved in one of the physiological studied and provide a summary report on it.	a3, c1, d1	4-13	6
2	<b>Group</b> : each group of students will be assigned todo a search on one of the physiological processes studied and make a summary report.	a4, c1	14	4





## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b4, b5, b6, c1, d1, d2
2	Assignments (1 + 2)	4, 14	10	10	a3, a4, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b4, b5
4	Mid-semester exam of theoretical part (written exam)	7	20	20	a1, a2, a3, a4, b4, b5, b6, c1, d1, d2
5	Final exam of theoretical part (written exam)	17	60	60	a1, a2, a3, a4, b4, b5, b6, c1, d1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. C.C.Chatterjee. Human physiology
2. Laurie kelly . Essential of human physiology for pharmacy, 2004, CRC press

### 2- Essential References.

4. Hassan Hamdi, Fundamentals of human physiology
5. Salah Abu-Sitta , Synopsis of medical physiology
6. W. F. Ganong. Review of medical physiology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### COMMUNITY MEDICINE

I. Course Identification and General Information:					
1.	Course Title:	COMMUNITY MEDICINE			
2.	Course Code & Number:				
3.	Credit hours:	C.H			TOTAL
		Theoretical		P.	
		L.	Tut.	S.	
		2	-	-	2
4.	Study level/ semester at which this course is offered:	( THIRD ) Year – ( 1ST ) semester			
5.	Pre –requisite (if any):				
6.	Co –requisite (if any):				
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10.	Prepared By:	collage			
11.	Date of Approval	2015			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

To prepare the Community Medicine specialist of higher caliber, who an understanding of clinical practice of Epidemiological principles and methods and the Epidemiology of communicable and non-communicable disease, a familiarity with statistical methods, the relevant aspects and social sciences and the principles of administration and management, and the ability to use this knowledge to the management of health services and the study of diseases and health..



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1 Identify patterns of existence of disease.
2.		a2. Explain the epidemiological triangle.
3.		a3. Describe different types of epidemiological methods and the sources of epidemiological data.
4.		a4.. - Recognize types of communicable and non-communicable diseases.
5.	A3	a5. - Discuss concept of hospital infection.
6.	B1	B.1-Differentiate between types of epidemiological methods.
7.	B2	B.2-Distinguish between communicable and non-communicable disease.
8.	B3	B.3 Draw and Interpret the epidemic curve.
9.	B4	B4 Apply the principles of infection control.
10.	C2	c1. demonstrate skills of presentation of a research.
11.	C3	c2 .Search efficiently for information using documented and electronic sources of information.
12.	C4	c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. Work successfully in team-activities.
14.	D2	d2.Demonstrate the ability to practice contemporary pharmacy in accordance with professional, legal and ethical standards.
15.	D3	d3. Communicate effectively and cooperate with colleagues, members of health care team, patients and other people.
16.	D4	d4. Demonstrate the ability of time management, self-learning and problem-solving skills



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2 , a3, a5	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1,	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	seminar	seminar assessment
c2, c3	feed-back learning, Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
	Feed-back learning	Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>CONCEPTS IN HEALTH</b>	a1, a5, d2	<ul style="list-style-type: none"> <li>Definition health: appreciation of health as a relative concept, determinants of health, characteristics of agent, host and environmental factors in health and disease and the manufactorial etiology of disease, understanding of various levels of prevention with appropriate examples, indices used in measurement of health</li> </ul>	1	3
2	<b>Epidimology-I</b>	a3, a5, d2	<ol style="list-style-type: none"> <li>1. Use of epidemiological tools to make a community diagnosis of the health situation in order to formulate appropriate intervention measures. Epidemiology, definition concept and role in health and disease.</li> <li>2. Definition of the terms used in describing disease transmission and control.</li> <li>3. Natural history of a disease and its application in planning intervention.</li> <li>4. Modes of transmission and measures for prevention and control of communicable and non-communicable disease.</li> <li>5. Principal sources of epidemiological data.</li> <li>6. Definition, calculation and interpretation of the measures of frequency of diseases and morality.</li> <li>7. Common sampling techniques, simple statistical methods for the analysis, interpretation and presentation of data frequency distribution, measures of central tendency, measures of variability, statistical tests of significance and their application.</li> <li>8. Need and uses of screening tests.</li> </ol>	2	6



	Pharmacy Bachelor		<p>9. Accuracy and clinical value of diagnostic and screening tests (sensitivity, specificity &amp; predictive value)</p> <p>10. Epidemiology of communicable and non-communicable diseases of public health importance and their control</p> <p>11. Epidemiological basis of national health programmes</p> <p>12. Awareness of programmes for control of non-communicable diseases</p>		
3	<b>Epidimology-II</b>	, a5, , d2	<p>13. (a) Planning and investigation of an epidemic of communicable diseases in a community setting (b) Institution of control measures and evaluation of the effectiveness of these measures]</p> <p>14. Various types of epidemiological designs.</p> <p>15. The derivation of normal values and the criteria for intervention in case of abnormal values</p> <p>16. Planning an interventional programme with community participation based on the community diagnosis</p> <p>17. Applications of computers in epidemiology</p> <p>18. Critical evaluation of published research</p>	5	15
	• MID-TERM EXAM			1	3
4	<b>EPIDEMIOLOGY OF SEPECIFIC DISEASES</b>	a2, a5, b1, d2	<ul style="list-style-type: none"> <li>The specific objective of selected communicable diseases of public health importance for which National Disease Control/Eradication Programmes have formulated are described here.</li> <li>For other diseases, the individual teacher would formulate the objective while drawing the lesson plans. The idea of the formulating</li> </ul>	2	6





	Pharmacy Bachelor		<p>objectives for a few diseases is to highlight their importance and to emphasis certain outcomes.</p> <ul style="list-style-type: none"> <li>• Infective hepatitis ARI, T.B. , Malaria STDs and AIDS Diarrhea diseases , kala Azar, Mental Health , coronary heart disease, Blindness, Hypertension, Leprosy</li> <li>• Accidents, JF, VPDs, Plague, Chickenpox etc.</li> </ul>		
5	<b>ENTOMOLOGY</b>	a2, a5, , d2	<p>Role of vectors in the causation of diseases, Steps in management of a case of insecticide toxicity, Identifying feature of and mode of transmission of vector brome diseases, methods control with advantages and limitations of each, mode of action, dose and application cycle of commonly used insecticides.</p>	3	9
6-	<b>ENVIRONMENTAL SANITATION</b>	, a1, a2, a3, a5, b1, , , d2	<p>1. Awareness of relation of Environment of Health, Awareness of the concept of safe and wholesome water, Awareness of the requirements of a sanitary sources of water, Understanding the methods of purification of water on small scale with stress on chlorination of water, Various biological standards</p> <p>2. Concepts of safe disposal of human excreta</p> <p>3. Physical chemical standards; tests for assessing quality of water</p> <p>4. Disposal of solid waste, liquid wastes both in the context of urban and rural condition</p> <p>5. Problems in the disposal of refuse, sullage and sewage</p> <p>6. Sources health hazards and control of environmental pollution, Influence of physical factors – like heat, humidity, cold radiation and noise – on the health of the individual and community, standards of housing and the effect of poor housing on health</p>	1	3
FINAL - EXAM				1	3
TOTAL				16	48
Number of Weeks /and Units Per Semester				16 weeks	6 Units



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>
<p><b>Seminars</b>: these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to prepare a scientific article on topics selected by the teachers	c2, c3,	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a scientific presentation on a topic selected by the teacher.	b1, c2, c3, d1, d3,	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	, a1, a2, a3, a5, b1, d2
2	Assignments (1 + 2) including seminar	4, 14	10	10	b1, c2, c3, d1, d4,
3	Quiz 1 + Quiz 2	7, 12	5	5	b1,
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	, a1, a2, a3, a5, b1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	, a1, a2, a3, a5, b1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

Text book of community medicin , 3rd eidition

Epidemiology , Biostatics & prevent medicin

Nutritive , child development KE.4 th edition 2010



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

Republic of Yemen  
Ministry of Higher Education  
& Scientific Research  
Yemen University  
College of medical sciences  
Department of pharmacy  
Program of Pharmacy Bachelor



الجمهورية اليمنية  
وزارة التعليم العالي والبحث العلمي  
جامعة اليمن  
كلية العلوم الطبية  
قسم الصيدلة  
برنامج بكالوريوس الصيدلة



## Course Specification

### **PUBLIC HEALTH & FIRST AID**

I. Course Identification and General Information:							
1.	Course Title:	PUBLIC HEALTH &FIRST AID					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( THIRD ) Year – ( 2ND ) semester					
5.	Pre –requisite (if any):	NONE					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of basic issues relate to health of the community.

Besides, the course provides necessary knowledge of how to provide aid to injured and accidental casualties..



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Define first aid and its objectives and significance.
2.	A3	a2. Discuss the principles of first aid in various emergency situations
3.		a3. Identify the steps to be carried out in first aid of different types of accidents and injuries.
4.	A3	a4. Comprehend his/her role as a pharmacist to implement and participate in primary health care and epidemic-diseases control programs and in assisting health care team to provide first aid services.
5.	B2	b1. Compare between the procedures of first-aid of various injuries and accidents.
6.	C2	c1. Assist & participate with members of health care team in offering first aid to patients
7.	C4	c2. Search efficiently for information using documented and electronic sources of information.
8.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
9.	D1	d1. work successfully in team-work.
10.	D2	d2. Show respect to life and commit to patients serving and Comply to pharmacy laws and ethics.
11.	D3	d3. Communicate effectively with colleagues , members of health care team and patients.
12.	D4	d4.. Demonstrate time management and self-learning during performing practical and professional works and assignments.





## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3 , a4	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3	feed-back learning, Group-project , laboratory practice	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance



## IV. Course Content:

### a. Theoretical part

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to first-aid</b>	a1, a4	<ul style="list-style-type: none"> <li>Definition, concept and history of first aid</li> <li>objectives and responsibilities of first aid</li> <li>role of pharmacist in assisting health care team in providing first-aid to patients.</li> <li>General principles of first-aid</li> </ul>	2	4
2	<b>First aid of various accidents and injuries and conditions</b>	a2, a3, b1, d2	<ul style="list-style-type: none"> <li>first-aid of fractures and dislocation</li> <li>first-aid of bleeding &amp; injuries</li> <li>first aid of hypotension &amp; shock</li> <li>first aid of cardiac arrest</li> </ul>	4	8
			• mid term exam	1	
2	a2, a3, b1, d2	a1, a2, a3, a4, b1, d2	<ul style="list-style-type: none"> <li>first-aid of burns &amp; sunburn &amp; frost</li> <li>first-aid of animal bites, stings</li> <li>first-aid of drowning and asphyxia</li> <li>first-aid of epileptic seizures</li> <li>first-aid of diabetic coma</li> <li>first-aid of poisoning</li> </ul>	7	14
<b>Course Review</b>		a2, a3, b1, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	2 Units



<b>b - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Couse Intended Learning Outcomes CILOs</b>
1.	first aid of Fracture and dislocation	1	2	c1, d1, d2, d3, d4
2.	first-aid of bleeding	1	2	c1, d1, d2, d3, d4
3.	first aid of hypotension	1	2	c1, d1, d2, d3, d4
4.	first aid of cardiac arrest	1	2	c1, d1, d2, d3, d4
5.	first-aid of burns	1	2	c1, d1, d2, d3, d4
6.	first-aid of animal bites, stings	2	2	c1, d1, d2, d3, d4
7.	first-aid of drowning and asphyxia	2	2	c1, d1, d2, d3, d4
8.	first-aid of epileptic seizures	1	2	c1, d1, d2, d3, d4
9.	first-aid of diabetic coma	2	2	c1, d1, d2, d3, d4
10.	first-aid of poisoning			c1, d1, d2, d3, d4
11.	Review	1	2	c1, d1, d2, d3, d4
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using vtechniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>lecture - Discussion</b>: a short lecture/ address followed by discussion</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
2	<b>Group</b> : each group of students will be assigned to provide a search-based report for comparison of first-aid procedures of cases not included in the theoretical part of the course.	c2, c3 , d1, d4	14	5



## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment %	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, a4, b1, d2
2	Assignments (1 + 2)	4-13, 14	5	5	c2, c3 , d1, d4
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b1
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, a4, b1, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, d2
TOTAL			60	60	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment%	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	c1, d1, d3, d4
2	Lab. Attitude	weekly	2.5	2.5	d1, d2
3	Lab. Accomplishments	weekly	5	5	c1
4	Lab. Reporting	weekly	2.5	2.5	c3
5	Exam of practice theory (written exam or oral exam)	14	5	5	c1, d3, d4
6	Practical exam (practical)	14	20	20	c1, d3, d4
TOTAL			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. David Pencheon. Oxford handbook of public health Practice
2. القواعد العامة للإسعافات الأولية د/ محمد ابراهيم شلبي

### 2- Essential References.

1. N. Murugesh Health Education and community pharmacy

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### GENERAL PHARMACOGNOSY I

I. Course Identification and General Information:							
1.	Course Title:	GENERAL PHARMACOGNOSY I					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( THIRD ) Year – ( 1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	• General biology					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course provides the students with introduction to medicinal plants as an important natural source of drugs. Besides, the course deals with study of common medicinal leaves, barks, roots and rhizomes





### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the botanical origin, morphological and microscopical characteristics of common medicinal leaves, barks, roots and rhizomes.
2.	A2	a2. Determine the active constituents and therapeutic use of common medicinal leaves, barks, roots and rhizomes.
3.	A3	a3. Discuss the principles and procedures applied for obtaining appropriate crude drugs from plants.
4.		a4. Explicit the methods used for detection of active constituents and discovering adulteration of medicinal plants.
5.	A4	a5. Comprehend his/her role as pharmacist in collection, detection, and rational therapeutic use of medicinal plants.
6.	B1	b1. Express with drawings the morphology and key microscopical features of medicinal plants
7.		b2. Differentiate between common medicinal leaves, barks, roots and rhizomes based on morphological and microscopical features.
8.	B2	b3. Classify active constituents in medicinal plants.
9.		b4. Compare between common medicinal leaves, barks, roots and rhizomes according to their botanical origin, plant parts, chemical structures and therapeutic use.
10.	B3	b5. Design a plan to obtain medicinal plants and crude drugs of high quality.
11.	B4	b6. Assess the quality of medicinal plants and crude drugs.
12.		b7. Select the appropriate day time/season for cultivation of medicinal plants.
13.	C1	c1. Handle efficiently the tools and chemicals used in pharmacognosy and phytochemistry Lab.
14.		c2. Operate successfully the instruments used in pharmacognosy and phytochemistry Lab.
15.	C2	c3. Perform effectively using standard procedures the practical works in pharmacognosy and phytochemistry Lab.
16.	C3	c4. Take the required safety criteria during performing different types of pharmacy works



17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Work successfully in team-work.
20.	D2	d2. Show respect to life & behave in discipline during practicing practical and professional works and assignments.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4. Demonstrate time management and self-learning during performing practical works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, lab. practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
a5	lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3, b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance



b7	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning , Group-project	Assignments
c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) , Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a3, a4, a5, b5,b6, b7, d2	<ul style="list-style-type: none"> <li>□ Definition, importance, and function, brief history</li> <li>□ Crude, official and unofficial drugs.</li> <li>□ Nomenclature of crude drugs (botanical, geographical and commercial sources of drugs)</li> <li>□ Classification of crude drugs (alphabetical, taxonomical, morphological, pharmacological and chemical)</li> <li>□ Cultivation (Disadvantages of collecting wild plants and advantages of cultivation, factors affecting cultivation).</li> <li>□ Collection (Time of the year, time of the day, stage of the development of the plant and general rules of collection).</li> <li>□ Post-collection processing of crude drugs: Drying(Natural methods, artificial methods, changes occurring after drying), Preservation and protection of crude drugs(deterioration during storage, physicochemical factors, biological factors, methods to destroy and control of insects)</li> <li>□ Adulteration(sophistication, substitution, admixture and deterioration, determination of adulteration.)</li> </ul>	4	8
2	<b>Natural Chemical constituents in plants</b>	a2, a4, a5	Types , biological and pharmaceutical and therapeutic roles of : starch, proteins, fixed oils and fats, terpenes, etc., gums, mucilage, resins, tannins ,alkaloids, volatile oils and glycosides etc.	2	4
<b>MID-TERM EXAM</b>				1	2



3	<b>Medicinal leaves</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal leaves: Digitalis, Senna, Stramonium, Belladonna, Hyoscymus, Bucho, Boldo , Coca, Jaborandi, Henna.	3	6
4	<b>Medicinal barks</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal barks: Cinchona, Cinnamon, Frangula, Quillaia, Pomegranate, Hamamelis and Galls.	2	4
5	<b>Medicinal roots and rhizomes</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal roots and rhizomes : Liquorice, Ipecacuanha, Rauwolfia, Senega, Ginger, Colchicum, Squill, Ginseng, Rhubarb, Curcuma, Podophyllum, Aconite, Veratrum, Sasaparilla, Kava-kava	2	4
<b>Course Review</b>		a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units



## B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	preparation of hard parts of plant(e.g. roots, seeds), for investigation : drying, grinding, treating with reagents , etc	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
2.	preparation of soft parts of plant(e.g. leaves, flowers), for investigation : drying, grinding, treating with reagents , etc	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
3.	microscopical Detection of types of calcium oxalate in plant	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
4.	microscopical Detection of types of starch in plant	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
5.	morphology and microscopical determination of medicinal leaves : senna leaves	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
6.	morphology and microscopical determination of medicinal leaves : Henna leaves	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
7.	morphology and microscopical determination of medicinal barks : cinnamon bark	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
8.	morphology and microscopical determination of medicinal barks : pomegranate bark	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
9.	morphology and microscopical determination of medicinal roots & rhizomes: Ginger	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
10.	morphology and microscopical determination of medicinal roots & rhizomes: liquorice	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
11.	Review	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search on the pharmaceutical products available in the drug market of one plant drug studied in the course.	a2, c5, c6,	4-13	3
2	<b>Group</b> : each group of students will be assigned to do search report for adulteration of one crude drug studied in the course.	b6, c5, c6, d1, d3,	14	2





VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, a5, b2, b3, b4, b5
2	Assignments (1 + 2)	4-13, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a5, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5, b2, b3, b4, b5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	



## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders
<b>2- Essential References.</b>
1. Jarald. Colour atlas of medicinal plants 2. Bhandari. Textbook of pharmacognosy.
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of GENERAL PHARMACOGNOSY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course provides the students with introduction to medicinal plants as an important natural source of drugs. Besides, the course deals with study of common medicinal leaves, barks, roots and rhizomes



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the botanical origin, morphological and microscopical characteristics of common medicinal leaves, barks, roots and rhizomes.
2.	A2	a2. Determine the active constituents and therapeutic use of common medicinal leaves, barks, roots and rhizomes.
3.	A3	a3. Discuss the principles and procedures applied for obtaining appropriate crude drugs from plants.
4.		a4. Explicit the methods used for detection of active constituents and discovering adulteration of medicinal plants.
5.	A4	a5. Comprehend his/her role as pharmacist in collection, detection, and rational therapeutic use of medicinal plants.
6.	B1	b1. Express with drawings the morphology and key microscopical features of medicinal plants
7.		b2. Differentiate between common medicinal leaves, barks, roots and rhizomes based on morphological and microscopical features.
8.	B2	b3. Classify active constituents in medicinal plants.
9.		b4. Compare between common medicinal leaves, barks, roots and rhizomes according to their botanical origin, plant parts, chemical structures and therapeutic use.
10.	B3	b5. Design a plan to obtain medicinal plants and crude drugs of high quality.
11.	B4	b6. Assess the quality of medicinal plants and crude drugs.
12.		b7. Select the appropriate day time/season for cultivation of medicinal plants.
13.	C1	c1. Handle efficiently the tools and chemicals used in pharmacognosy and phytochemistry Lab.
14.		c2. Operate successfully the instruments used in pharmacognosy and phytochemistry Lab.
15.	C2	c3. Perform effectively using standard procedures the practical works in pharmacognosy and phytochemistry Lab.
16.	C3	c4. Take the required safety criteria during performing different types of pharmacy works



17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Work successfully in team-work.
20.	D2	d2. Show respect to life & behave in discipline during practicing practical and professional works and assignments.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4. Demonstrate time management and self-learning during performing practical works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, lab. practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
a5	lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3, b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance



b7	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning , Group-project	Assignments
c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) , Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a3, a4, a5, b5,b6, b7, d2	<ul style="list-style-type: none"> <li>□ Definition, importance, and function, brief history</li> <li>□ Crude, official and unofficial drugs.</li> <li>□ Nomenclature of crude drugs (botanical, geographical and commercial sources of drugs)</li> <li>□ Classification of crude drugs (alphabetical, taxonomical, morphological, pharmacological and chemical)</li> <li>□ Cultivation (Disadvantages of collecting wild plants and advantages of cultivation, factors affecting cultivation).</li> <li>□ Collection (Time of the year, time of the day, stage of the development of the plant and general rules of collection).</li> <li>□ Post-collection processing of crude drugs: Drying(Natural methods, artificial methods, changes occurring after drying), Preservation and protection of crude drugs(deterioration during storage, physicochemical factors, biological factors, methods to destroy and control of insects)</li> <li>□ Adulteration(sophistication, substitution, admixture and deterioration, determination of adulteration.)</li> </ul>	4	8
2	<b>Natural Chemical constituents in plants</b>	a2, a4, a5	Types , biological and pharmaceutical and therapeutic roles of : starch, proteins, fixed oils and fats, terpenes, etc., gums, mucilage, resins, tannins ,alkaloids, volatile oils and glycosides etc.	2	4
<b>MID-TERM EXAM</b>				1	2





3	<b>Medicinal leaves</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal leaves: Digitalis, Senna, Stramonium, Belladonna, Hyoscymus, Bucho, Boldo , Coca, Jaborandi, Henna.	3	6
4	<b>Medicinal barks</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal barks: Cinchona, Cinnamon, Frangula, Quillaia, Pomegranate, Hamamelis and Galls.	2	4
5	<b>Medicinal roots and rhizomes</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal roots and rhizomes : Liquorice, Ipecacuanha, Rauwolfia, Senega, Ginger, Colchicum, Squill, Ginseng, Rhubarb, Curcuma, Podophyllum, Aconite, Veratrum, Sasaparilla, Kava-kava	2	4
<b>Course Review</b>		a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units



## B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	preparation of hard parts of plant(e.g. roots, seeds), for investigation : drying, grinding, treating with reagents , etc	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
2.	preparation of soft parts of plant(e.g. leaves, flowers), for investigation : drying, grinding, treating with reagents , etc	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
3.	microscopical Detection of types of calcium oxalate in plant	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
4.	microscopical Detection of types of starch in plant	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
5.	morphology and microscopical determination of medicinal leaves : senna leaves	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
6.	morphology and microscopical determination of medicinal leaves : Henna leaves	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
7.	morphology and microscopical determination of medicinal barks : cinnamon bark	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
8.	morphology and microscopical determination of medicinal barks : pomegranate bark	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
9.	morphology and microscopical determination of medicinal roots & rhizomes: Ginger	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
10.	morphology and microscopical determination of medicinal roots & rhizomes: liquorice	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
11.	Review	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search on the pharmaceutical products available in the drug market of one plant drug studied in the course.	a2, c5, c6,	4-13	3
2	<b>Group</b> : each group of students will be assigned to do search report for adulteration of one crude drug studied in the course.	b6, c5, c6, d1, d3,	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, a5, b2, b3, b4, b5
2	Assignments (1 + 2)	4-13, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a5, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5, b2, b3, b4, b5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	



## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders
<b>2- Essential References.</b>
1. Jarald. Colour atlas of medicinal plants 2. Bhandari. Textbook of pharmacognosy.
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### GENERAL PHARMACOGNOSY II

I. Course Identification and General Information:							
1.	Course Title:	GENERAL PHARMACOGNOSY II					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( THIRD ) Year – ( 2 <sup>ND</sup> ) semester					
5.	Pre –requisite (if any):	• General Pharmacognosy I					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with study of common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the botanical origin, morphological and microscopical characteristics of common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs.
2.	A2	a2. Determine the active constituents and therapeutic use of common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs.
3.	A3	a3. Discuss the principles and procedures applied for obtaining appropriate crude drugs from plants.
4.		a4. Explicit the methods used for detection of active constituents and discovering adulteration of medicinal plants.
5.	A4	a5. Comprehend his/her role as pharmacist in collection, detection, and rational therapeutic use of medicinal plants.
6.	B1	b1. Express with drawings the morphology and key microscopical features of medicinal plants
7.		b2. Differentiate between common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs based on morphological and microscopical features.
8.	B2	b3. Classify active constituents in medicinal plants.
9.		b4. Compare between common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs according to their botanical origin, plant parts, chemical structures and therapeutic use.
10.	B3	b5. Design a plan to obtain medicinal plants and crude drugs of high quality.
11.	B4	b6. Assess the quality of medicinal plants and crude drugs.
12.		b7. Select the appropriate day time/season for cultivation of medicinal plants.
13.	C1	c1. Handle efficiently the tools and chemicals used in pharmacognosy and phytochemistry Lab.
14.		c2. Operate successfully the instruments used in pharmacognosy and phytochemistry Lab.
15.	C2	c3. Perform effectively using standard procedures the practical works in pharmacognosy and phytochemistry Lab.
16.	C3	c4. Take the required safety criteria during performing different types of



		pharmacy works
17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Show respect to life behave in discipline during practicing practical and professional works and assignments
21.	D3	d3. Communicate effectively with his/her colleagues.
22.		d4. Demonstrate the ability of time management and self-learning.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, lab. practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
a5	lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3, b4	Lecture	Written exam , Attendance





b5	Lecture	Written exam , Attendance
b7	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning , Group-project	Assignments
c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) , Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture , laboratory practice	Written exam , Attendance , lab.attitude



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Medicinal flowers</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal flowers : Clove, Chammoile, Pyrethrum, Tilia, Santonica, Lavender and Saffron..	3	6
2	<b>Medicinal seeds</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, active constituents and medical uses of the following medicinal bark seeds: Cardamom, Colchicine , nux vomica, Linseed, Nutmeg, Black and White Mustard, Fenugreek, Clabar and Nigella.	3	6
Mid-term exam				1	2
3	<b>Medicinal fruits</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, active constituents and medical uses of the following medicinal fruits Ammi vinaga, Anise, Fennel, Caraway, Capsicum, star Anise, Coriander, Vanilla and Senna	3	6
4	<b>Medicinal herbs</b>		Study of botanical origin, microscopical features, active constituents and medical uses of the following medicinal herbs : Ergot, Indian hemp, Chatharanthus, Lobelia, Peppermint, Thyme, Passiflora and Ephedra	2	4
5	<b>Unrecognized plant drugs</b>		<ul style="list-style-type: none"> <li>Definition , classification, chemical and physical properties</li> <li>Study of medicinal resin and resin combinations: Colophony, Myrrh, Tolu peru, Tolu Balsam, Oliabanum and Benzoin</li> <li>Medicinal gums , juices and extracts</li> </ul>	2	4
<b>Course Review</b>		a1, a2, a3, a4, a5, b1, b2, b4,	Review of the course topics by discussion session.	1	2



	b6,b7			
FINAL - EXAM			1	2
TOTAL			16	32
Number of Weeks /and Units Per Semester			16 weeks	5 Units



## B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	AlignedCourse Intended Learning Outcomes CILOs
1.	morphology and microscopical investigation of medicinal flowers : clove	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
2.	morphology and microscopical investigation of medicinal flowers : Saffron	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
3.	morphology and microscopical investigation of medicinal seeds cardamom	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
4.	morphology and microscopical investigation of medicinal seeds Black & white mustard	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
5.	morphology and microscopical investigation of medicinal fruits Anise	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
6.	morphology and microscopical investigation of medicinal fruits Fennel	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
7.	morphology and microscopical investigation of medicinal fruits Capsicum	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
8.	morphology and microscopical determination of medicinal herbs : Peppermint	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
9.	morphology and microscopical investigation of medicinal herbs : Thyme	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
10.	investigation of medicinal resin : Myrrh	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
11.	investigation of medicinal gum	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search on the pharmaceutical products available in the drug market of one plant drug studied in the course.	a2, c5, c6,	4-13	3
2	<b>Group</b> : each group of students will be assigned to do search report for adulteration of one crude drug studied in the course.	b6, c5, c6, d1, d3,	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, a5 b1, b2, b4, b5, b6, b7, d2
2	Assignments (1 + 2)	4-13 , 14	5	5	a2, b6, c5, c6, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b4
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a2, a4, a5 , b5,b6, b7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5 b1, b2, b4, b5,b6, b7, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6
6	Practical exam (practical)	14	20	20	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders

### 2- Essential References.

1. Jarald. Colour atlas of medicinal plants
2. Bhandari. Textbook of pharmacognosy.
3. Gokhale. Practical pharmacognosy

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of GENERAL PHARMACOGNOSY II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with study of common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs.





### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the botanical origin, morphological and microscopical characteristics of common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs.
2.	A2	a2. Determine the active constituents and therapeutic use of common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs.
3.	A3	a3. Discuss the principles and procedures applied for obtaining appropriate crude drugs from plants.
4.		a4. Explicit the methods used for detection of active constituents and discovering adulteration of medicinal plants.
5.	A4	a5. Comprehend his/her role as pharmacist in collection, detection, and rational therapeutic use of medicinal plants.
6.	B1	b1. Express with drawings the morphology and key microscopical features of medicinal plants
7.		b2. Differentiate between common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs based on morphological and microscopical features.
8.	B2	b3. Classify active constituents in medicinal plants.
9.		b4. Compare between common medicinal flowers, seeds, fruits, herbs and unrecognized plant drugs according to their botanical origin, plant parts, chemical structures and therapeutic use.
10.	B3	b5. Design a plan to obtain medicinal plants and crude drugs of high quality.
11.	B4	b6. Assess the quality of medicinal plants and crude drugs.
12.		b7. Select the appropriate day time/season for cultivation of medicinal plants.
13.	C1	c1. Handle efficiently the tools and chemicals used in pharmacognosy and phytochemistry Lab.
14.		c2. Operate successfully the instruments used in pharmacognosy and phytochemistry Lab.
15.	C2	c3. Perform effectively using standard procedures the practical works in pharmacognosy and phytochemistry Lab.
16.	C3	c4. Take the required safety criteria during performing different types of



		pharmacy works
17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Show respect to life behave in discipline during practicing practical and professional works and assignments
21.	D3	d3. Communicate effectively with his/her colleagues.
22.		d4. Demonstrate the ability of time management and self-learning.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, lab. practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance
a5	lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3, b4	Lecture	Written exam , Attendance



b5	Lecture	Written exam , Attendance
b7	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning , Group-project	Assignments
c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) , Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture , laboratory practice	Written exam , Attendance , lab.attitude



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Medicinal flowers</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, cultivation, adulteration detection, active constituents and medical uses of the following medicinal flowers : Clove, Chammoile, Pyrethrum, Tilia, Santonica, Lavender and Saffron..	3	6
2	<b>Medicinal seeds</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, active constituents and medical uses of the following medicinal bark seeds: Cardamom, Colchicine , nux vomica, Linseed, Nutmeg, Black and White Mustard, Fenugreek, Clabar and Nigella.	3	6
Mid-term exam				1	2
3	<b>Medicinal fruits</b>	a1, a2, a3, a4, a5, b1, b2, b4, b6,b7	Study of botanical origin, microscopical features, active constituents and medical uses of the following medicinal fruits Ammi vinaga, Anise, Fennel, Caraway, Capsicum, star Anise, Coriander, Vanilla and Senna	3	6
4	<b>Medicinal herbs</b>		Study of botanical origin, microscopical features, active constituents and medical uses of the following medicinal herbs : Ergot, Indian hemp, Chatharanthus, Lobelia, Peppermint, Thyme, Passiflora and Ephedra	2	4
5	<b>Unrecognized plant drugs</b>		<ul style="list-style-type: none"> <li>Definition , classification, chemical and physical properties</li> <li>Study of medicinal resin and resin combinations: Colophony, Myrrh, Tolu peru, Tolu Balsam, Oliabanum and Benzoin</li> <li>Medicinal gums , juices and extracts</li> </ul>	2	4
<b>Course Review</b>		a1, a2, a3, a4, a5, b1, b2, b4,	Review of the course topics by discussion session.	1	2



	b6,b7			
FINAL - EXAM			1	2
TOTAL			16	32
Number of Weeks /and Units Per Semester			16 weeks	5 Units



## B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	AlignedCourse Intended Learning Outcomes CILOs
1.	morphology and microscopical investigation of medicinal flowers : clove	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
2.	morphology and microscopical investigation of medicinal flowers : Saffron	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
3.	morphology and microscopical investigation of medicinal seeds cardamom	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
4.	morphology and microscopical investigation of medicinal seeds Black & white mustard	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
5.	morphology and microscopical investigation of medicinal fruits Anise	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
6.	morphology and microscopical investigation of medicinal fruits Fennel	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
7.	morphology and microscopical investigation of medicinal fruits Capsicum	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
8.	morphology and microscopical determination of medicinal herbs : Peppermint	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
9.	morphology and microscopical investigation of medicinal herbs : Thyme	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
10.	investigation of medicinal resin : Myrrh	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
11.	investigation of medicinal gum	1	2	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search on the pharmaceutical products available in the drug market of one plant drug studied in the course.	a2, c5, c6,	4-13	3
2	<b>Group</b> : each group of students will be assigned to do search report for adulteration of one crude drug studied in the course.	b6, c5, c6, d1, d3,	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, a5 b1, b2, b4, b5, b6, b7, d2
2	Assignments (1 + 2)	4-13 , 14	5	5	a2, b6, c5, c6, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b4
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a2, a4, a5 , b5,b6, b7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5 b1, b2, b4, b5,b6, b7, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6, d1, d3, d4,
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6
6	Practical exam (practical)	14	20	20	a1, a4, a5, b1, b2, b4, b6, c1, c2, c3, c4, c6
Total			40	40 %	





## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders

### 2- Essential References.

1. Jarald. Colour atlas of medicinal plants
2. Bhandari. Textbook of pharmacognosy.
3. Gokhale. Practical pharmacognosy

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACY LAW & ETHICS

I. Course Identification and General Information:					
1.	Course Title:	PHARMACY LAW & ETHICS			
2.	Course Code & Number:				
3.	Credit hours:	C.H			TOTAL
		Theoretical		P.	
		L.	Tut.	S.	
		2	-	-	2
4.	Study level/ semester at which this course is offered:	( THIRD ) Year – ( FIRST ) semester			
5.	Pre –requisite (if any):	Introduction to pharmacy			
6.	Co –requisite (if any):	---			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10.	Prepared By:				
11.	Date of Approval	2019			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of local and global regulations & ethics that must be obeyed and considered in the medical professions.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Define the rights of patients that should be considered during practicing medical profession.
2.	A3	a2. Define acts, regulations, laws code of ethics
3.		a3. Discuss the code of ethics, regulations and acts controlling the medical professions in Yemen , Arabic countries and globally.
4.		a4. Identify the main organizations controlling code of ethics in Yemen, Arabic countries and Globally.
5.	A4	a5. Comprehend his/her role as a pharmacist to implement and obey regulations and acts of medical professions.
6.	B2	b1. Compare between local, Arabic and international code of ethics and regulations of medical professions.
7.	B3	b2. Predict the patient right that should be considered by comprehending the code of ethics.
8.	C4	c1 .Search efficiently for information using documented and electronic sources of information.
9.		c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. work successfully in team-work.
11.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
12.	D3	d3. Communicate effectively with his/her colleagues, members of health care team, patients and community
13.	D4	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3 , a4, a5	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a2, a5, d2	<ul style="list-style-type: none"> <li>Definition of regulations, act, laws</li> <li>History of medical regulations</li> <li>Patients Rights</li> </ul>	3	6
2	<b>Patients and professional Rights</b>	a1, a5, b2, d2	<ul style="list-style-type: none"> <li>Patient rights</li> <li>Medical workers rights</li> </ul>	2	4
3	<b>Professional organization</b>	a4, a5, d2	for medical ethics and regulation : <ul style="list-style-type: none"> <li>Local</li> <li>Arabic</li> <li>International</li> </ul>	2	4
			<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>	1	2
4	<b>Code of Ethics</b>	a3, a5, b1, d2	for medical professions and regulation : <ul style="list-style-type: none"> <li>Old (Oath of Hippocrates)</li> <li>Arab countries</li> <li>Asian</li> <li>Europe</li> <li>USA</li> <li>Local (Yemeni) Code of ethics</li> </ul>	4	6
5	<b>Regulations of medical professions</b>	a3, a5, b2, d2	Regulations and acts controlling medical professions : <ul style="list-style-type: none"> <li>Local (Yemeni)</li> <li>Arabic</li> <li>Global e.g. USA , Europe</li> </ul>	2	8
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, , b2, b2, d2	Review of the course topics by discussion session.	1	2
			FINAL - EXAM	1	2
	<b>TOTAL</b>			16	32
	<b>Number of Weeks /and Units Per Semester</b>			16 weeks	5 Units



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.  
The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one code of ethics in one Arabian country	c1, c2,	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report for comparison of regulations of medical professions between different countries	b1, c1, c2, d1, d3,	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, , b2, b2, d2
2	Assignments (1 + 2)	4, 14	10	10	b1, c1, c2, d1, d4,
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, , b2, b2, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, , b2, b2, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. قانون المهن الطبية – الجمهورية اليمنية
2. Code of ethics; world health organization

### 2- Essential References.

1. code of ethics, council of health ministers in Arab gulf countries, 2009

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.





## Course Plan (Syllabus) of

### MEDICAL ETHICS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of local and global regulations & ethics that must be obeyed and considered in the medical professions.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Define the rights of patients that should be considered during practicing medical profession.
2.	A3	a2. Define acts, regulations, laws code of ethics
3.		a3. Discuss the code of ethics, regulations and acts controlling the medical professions in Yemen , Arabic countries and globally.
4.		a4. Identify the main organizations controlling code of ethics in Yemen, Arabic countries and Globally.
5.	A4	a5. Comprehend his/her role as a pharmacist to implement and obey regulations and acts of medical professions.
6.	B2	b1. Compare between local, Arabic and international code of ethics and regulations of medical professions.
7.	B3	b2. Predict the patient right that should be considered by comprehending the code of ethics.
8.	C4	c1 .Search efficiently for information using documented and electronic sources of information.
9.		c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. work successfully in team-work.
11.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
12.	D3	d3. Communicate effectively with his/her colleagues, members of health care team, patients and community
13.	D4	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3 , a4, a5	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a2, a5, d2	<ul style="list-style-type: none"> <li>Definition of regulations, act, laws</li> <li>History of medical regulations</li> <li>Patients Rights</li> </ul>	3	6
2	<b>Patients and professional Rights</b>	a1, a5, b2, d2	<ul style="list-style-type: none"> <li>Patient rights</li> <li>Medical workers rights</li> </ul>	2	4
3	<b>Professional organization</b>	a4, a5, d2	for medical ethics and regulation : <ul style="list-style-type: none"> <li>Local</li> <li>Arabic</li> <li>International</li> </ul>	2	4
			<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>	1	2
4	<b>Code of Ethics</b>	a3, a5, b1, d2	for medical professions and regulation : <ul style="list-style-type: none"> <li>Old (Oath of Hippocrates)</li> <li>Arab countries</li> <li>Asian</li> <li>Europe</li> <li>USA</li> <li>Local (Yemeni) Code of ethics</li> </ul>	4	6
5	<b>Regulations of medical professions</b>	a3, a5, b2, d2	Regulations and acts controlling medical professions : <ul style="list-style-type: none"> <li>Local (Yemeni)</li> <li>Arabic</li> <li>Global e.g. USA , Europe</li> </ul>	2	8
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, , b2, b2, d2	Review of the course topics by discussion session.	1	2
			FINAL - EXAM	1	2
	<b>TOTAL</b>			16	32
	<b>Number of Weeks /and Units Per Semester</b>			16 weeks	5 Units



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one code of ethics in one Arabian country	c1, c2,	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report for comparison of regulations of medical professions between different countries	b1, c1, c2, d1, d3,	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, , b2, b2, d2
2	Assignments (1 + 2)	4, 14	10	10	b1, c1, c2, d1, d4,
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, , b2, b2, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, , b2, b2, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. قانون المهن الطبية – الجمهورية اليمنية
2. Code of ethics; world health organization

### 2- Essential References.

1. code of ethics, council of health ministers in Arab gulf countries, 2009

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### Pharmaceutical Biochemistry II

I. Course Identification and General Information:							
1.	Course Title:	Pharmaceutical Biochemistry II					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( THIRD ) Year – ( 1ST ) semester					
5.	Pre –requisite (if any):	• Pharmaceutical biochemistry I					
6.	Co –requisite (if any):	-----					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals study of the types of biochemical compounds, including enzymes, vitamins, nucleic acids and hormones & the changes to which are undergone to in the body.





### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the biochemical compounds and that have significant roles in human and living organisms bodies.
2.	A2	a2. Explicit the physiological/pathological involvement of enzymes, vitamins, nucleic acids and hormones.
3.	A3	a3. Discuss the biosynthesis and metabolic pathways of biochemical compounds.
4.	B1	b1. Interpret certain body diseases based on disturbances in levels of body biochemicals
5.	B2	b2 . Solve biochemical problems related to nomenclature, synthetic and metabolic reactions.
6.		b3. Classify biochemicals into various categories.
7.		b4. Compare between different types of biochemical synthesis or metabolic reactions based on their income and outcomes products.
8.	B3	b5. Predict the outcomes of biochemical reactions.
9.	C1	c1.Handleefficiently the tools and chemicals used in biochemistry Lab.
10.		c2. Operate successfully the instruments used in biochemistry Lab.
11.	C2	c3 . Perform efficiently experiments and practical tasks for in vitro and in vivo identifications of biochemical compounds using standard procedures.
12.		c4. Take and prepare human samples to biochemistry investigations using standard procedures.
13.	C3	c5 .Take the required safety criteria during performing practical works in in biochemistry Lab.
14.	C4	c6 .Appropriately search for information and also present and report his/her work using various source of information and media technologies..
15.		c7. Use effectively symbols and figures and drawing to express chemical reactions and synthesis
16.	D1	d1. Share successfully in team-work.
17.	D2	d2. Show respect to life & behave in discipline during performing practical works in lab.



18.	D3	d3. Communicate effectively with his/her colleagues during performing practical works in in biochemistry Lab.
19.	D4	d4. Demonstrate time management and self-learning during performing assignments and during practical works in in biochemistry Lab

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	written exam , Practical assessment
a2	Lecture,, feed-back learning	written exam , assignment
a3	Lecture, feed-back learning, Group-project.	written exam , assignment
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	lecture, group-project, feed-back learning	Written exam, assignments
b2 , b3, b4	Lecture , , feed-back learning	written exam , quizzes
b5	Lecture,, feed-back learning	written exam, quizzes
(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment
c3, c4	Lab. Practice	Practical assessment
c5	Lab. Practice	Practical assessment
c6, c7	Group-project, feed-back learning	Written- exam , practical assessment , assignments



<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1</b>	<b>Group-project , feed-back learning</b>	<b>Assignment , Practical assessment</b>
<b>d2</b>	<b>lecture</b>	<b>Written exam</b>
<b>d3.</b>	<b>Lab. Practice</b>	<b>Practical assessment</b>
<b>d4</b>	<b>Lab. Practice</b>	<b>Practical assessment (Lab Attitude)</b>



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Enzymes</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Nomenclature</li> <li>Factors affecting enzyme action</li> <li>Enzyme kinetics</li> <li>Cytochrome P450 enzymes : classification, roles, stimulation and inhibition</li> <li>Pathological conditions related to enzymes.</li> </ul>	3	6
2	<b>Vitamins &amp; minerals &amp; trace elements</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Vitamins as coenzymes and their significance</li> <li>Metals as co-factors</li> <li>Role and significant of minerals and trace elements</li> </ul>	3	6
<b>MID-TERM EXAM</b>				1	2
	<b>Nucleic acids</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Basic structures</li> <li>Types (DNA, RNA), roles , biosynthesis and catabolism</li> <li>DNA replication and mutation</li> <li>DNA repair mechanism</li> </ul>	2	4
3	<b>Hormones</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	biosynthesis , catabolism and Pathological conditions related to : <ul style="list-style-type: none"> <li>Pituitary gland hormones</li> <li>Insulin</li> <li>Thyroxin</li> <li>Corticosteroids</li> <li>Sex hormones</li> </ul>	4	8 4
<b>Course Review</b>		a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	Review of the course topics by discussion session.	1	2



FINAL - EXAM	1	2
TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	7 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	Bioassay of liver-related enzymes	2	4	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
2.	Bioassay of Myocardial infarction-related enzymes	2	4	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
3.	Bioassay of minerals	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
4.	Isolation of DNA from human samples	2	4	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
5.	bioassay of thyroxin hormone	1		a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
6.	bioassay of sex hormones	2		a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
PRACTICAL EXAM		1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
Total		11	22 equivalent to 11 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with biochemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b2, c5, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to present a search report on one pathological condition related to disturbances in biochemical levels in the body.	b1, d1, , c6	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b1, b2, c5, c6, d1, d4,
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b5
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
2	Lab. Attitude	weekly	2.5	2.5	d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5	c6, c7
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
6	Practical exam (practical)	14	20	20	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Pamela C. Champe, Lippincott's illustrated review in Biochemistry, 2010, Lippincott William & Wilkins

### 2- Essential References.

1. Hiram f. Gilbert , Basic concepts in biochemistry ; a student's survival guide, 2000, McGraw-Hill
2. Vyas . Pharmaceutical biochemistry

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.





## Course Plan (Syllabus) of medical biochemistry II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals study of the types of biochemical compounds, including enzymes, vitamins, nucleic acids and hormones & the changes to which are undergone to in the body.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 3. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the biochemical compounds and that have significant roles in human and living organisms bodies.
2.	A2	a2. Explicit the physiological/pathological involvement of enzymes, vitamins, nucleic acids and hormones.
3.	A3	a3. Discuss the biosynthesis and metabolic pathways of biochemical compounds.
4.	B1	b1. Interpret certain body diseases based on disturbances in levels of body biochemicals
5.	B2	b2 . Solve biochemical problems related to nomenclature, synthetic and metabolic reactions.
6.		b3. Classify biochemicals into various categories.
7.		b4. Compare between different types of biochemical synthesis or metabolic reactions based on their income and outcomes products.
8.	B3	b5. Predict the outcomes of biochemical reactions.
9.	C1	c1.Handleefficiently the tools and chemicals used in biochemistry Lab.
10.		c2. Operate successfully the instruments used in biochemistry Lab.
11.	C2	c3 . Perform efficiently experiments and practical tasks for in vitro and in vivo identifications of biochemical compounds using standard procedures.
12.		c4. Take and prepare human samples to biochemistry investigations using standard procedures.
13.	C3	c5 .Take the required safety criteria during performing practical works in in biochemistry Lab.
14.	C4	c6 .Appropriately search for information and also present and report his/her work using various source of information and media technologies..
15.		c7. Use effectively symbols and figures and drawing to express chemical reactions and synthesis
16.	D1	d1. Share successfully in team-work.
17.	D2	d2. Show respect to life & behave in discipline during performing practical works in lab.



18.	D3	d3. Communicate effectively with his/her colleagues during performing practical works in in biochemistry Lab.
19.	D4	d4. Demonstrate time management and self-learning during performing assignments and during practical works in in biochemistry Lab .

1. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	written exam , Practical assessment
a2	Lecture,, feed-back learning	written exam , assignment
a3	Lecture, feed-back learning, Group-project.	written exam , assignment
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	lecture, group-project, feed-back learning	Written exam, assignments
b2 , b3, b4	Lecture, , feed-back learning	written exam , quizzes
b5	Lecture,, feed-back learning	written exam, quizzes
(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	Lab. Practice	Practical assessment
c3, c4	Lab. Practice	Practical assessment



<b>c5</b>	<b>Lab. Practice</b>	<b>Practical assessment</b>
<b>c6, c7</b>	<b>Group-project, feed-back learning</b>	<b>Written- exam , practical assessment , assignments</b>
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1</b>	<b>Group-project , feed-back learning</b>	<b>Assignment , Practical assessment</b>
<b>d2</b>	<b>lecture</b>	<b>Written exam</b>
<b>d3.</b>	<b>Lab. Practice</b>	<b>Practical assessment</b>
<b>d4</b>	<b>Lab. Practice</b>	<b>Practical assessment (Lab Attitude)</b>



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Enzymes</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Nomenclature</li> <li>Factors affecting enzyme action</li> <li>Enzyme kinetics</li> <li>Cytochrome P450 enzymes : classification, roles, stimulation and inhibition</li> <li>Pathological conditions related to enzymes.</li> </ul>	3	6
2	<b>Vitamins &amp; minerals &amp; trace elements</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Classifications and physiological roles</li> <li>Vitamins as coenzymes and their significance</li> <li>Metals as co-factors</li> <li>Role and significant of minerals and trace elements</li> </ul>	3	6
MID-TERM EXAM				1	2
3	<b>Nucleic acids</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	<ul style="list-style-type: none"> <li>Basic structures</li> <li>Types (DNA, RNA), roles , biosynthesis and catabolism</li> <li>DNA replication and mutation</li> <li>DNA repair mechanism</li> </ul>	2	4
4	<b>Hormones</b>	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	biosynthesis , catabolism and Pathological conditions related to : <ul style="list-style-type: none"> <li>Pituitary gland hormones</li> <li>Insulin</li> <li>Thyroxin</li> <li>Corticosteroids</li> <li>Sex hormones</li> </ul>	4	8
<b>Course Review</b>		a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2	Review of the course topics by discussion session.	1	2



FINAL - EXAM	1	2
TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	4 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	Bioassay of liver-related enzymes	2	4	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
2.	Bioassay of Myocardial infarction-related enzymes	2	4	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
3.	Bioassay of minerals	1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
4.	Isolation of DNA from human samples	2	4	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
5.	bioassay of thyroxin hormone	1		a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
6.	bioassay of sex hormones	2		a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
PRACTICAL EXAM		1	2	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
Total		11	22 equivalent to 11 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with biochemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b2, c5, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to present a search report on one pathological condition related to disturbances in biochemical levels in the body.	b1, d1, , c6	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b1, b2, c5, c6, d1, d4,
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b5
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
2	Lab. Attitude	weekly	2.5	2.5	d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	c1, c2, c3
4	Lab. Reporting	weekly	2.5	2.5	c6, c7
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
6	Practical exam (practical)	14	20	20	a1, c1, c2, c3, c4, c5, d1, d2, d3, d4,
Total			40	40 %	





## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Pamela C. Champe, Lippincott's illustrated review in Biochemistry, 2010, Lippincott William & Wilkins

### 2- Essential References.

1. Hiram f. Gilbert , Basic concepts in biochemistry ; a student's survival guide, 2000, McGraw-Hill
2. Vyas . Pharmaceutical biochemistry

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACETCAL MICROBIOLOGY II

I. Course Identification and General Information:							
1.	Course Title:	PHARMACETCAL MICROBIOLOGY II					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( THIRD ) Year – ( FIRST) semester					
5.	Pre –requisite (if any):	• Pharmaceutical microbiology I					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of pathogenic parasites commonly infecting humans. The study concerns with mode of infections, general characters, morphology, life cycle, pathogenesis, diagnosis, prevention and control of those parasites



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignement CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify and describe the microscopical/morphological features of common pathogenic parasites including protozoa , helminthes and arthropods.
2.		a2. Determine life cycle, pathogenicity, diagnosis, management of spread and treatment of common pathogenic parasites.
3.	A2	a3. Discuss the principles and technologies of parasitology applied for sampling and diagnosis of common pathogenic parasites infections
4.	B1	b1. Differentiate between similar parasites using morphological and microscopical techniques
5.	B2	b2 .Classify pathogenic parasites.
6.	B3	b3. Relate the severity of parasitic infections to its affecting factors such as immunity.
7.	C1	c1.Handleefficiently the tools and chemicals used in parasitology Lab.
8.		c2. Operate successfully the instruments used in parasitology Lab.
9.	C2	c3 . Perform effectively the experiments and practical tasks in microbiology Lab. including microscopical investigation using standard procedures.
10.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works
11.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
12.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. work successfully in team-work.
14.	D2	d2. Show respect to life & behave in discipline during practicing practical and professional works and assignments.
15.	D3	d3. Communicate effectively with his/her colleagues.
16.	D4	d4. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, Lecture	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam), Written exam , Attendance
a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance, quizzes

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1,	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes
b3	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:



Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture , laboratory practice	Written exam , Attendance, lab. attitude



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to parasites</b>	a1, a2, b1, b2, b3, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Definition &amp; Types of parasite (Ecto, endo ,obligate ,facultative )</li> <li><input type="checkbox"/> Types of host(Mechanical and biological ) and Host parasites relationship</li> <li><input type="checkbox"/> Effect of parasite on the host (Mechanical effect, effect on cell ,invasion and destruction ,inflammatory reaction to the parasite or production ,competition for host nutrient and toxic effect)</li> <li><input type="checkbox"/> Types of vector (obligate ,facultative )</li> <li><input type="checkbox"/> Source of infection (food&amp; drink, soil and water, vector ,direct contact and congenial)</li> <li><input type="checkbox"/> Mode of infection</li> <li><input type="checkbox"/> Classification of parasites (protozoa, helminthes , arthropods) classes and example for all class</li> </ul>	4	8
2	<b>Techniques for sampling and detection of parasites -</b>	a3	<ul style="list-style-type: none"> <li><input type="checkbox"/> Type of specimens (urine, stool, blood, etc.)</li> <li><input type="checkbox"/> Collection, transport and preservation of samples.</li> <li><input type="checkbox"/> Microscopic examination</li> <li><input type="checkbox"/> Direct Smear Method</li> </ul>	1	2
3	<b>Protozoa (introduction + Amoeba)</b>	a1, a2, a3, b1, b2, b3, d2	<p>General characteristic of protozoa(morphology, biological feature, multiplication ,nutrient, and locomotion )</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Classification (amoebae ,ciliate, flagellate, sporozoa)</li> <li><input type="checkbox"/> Amoebae <ul style="list-style-type: none"> <li>o Entamoebahistolytica ( Morphology ,life cycle, pathogenesis, Diagnosis, prevention and control)</li> <li>o Difference between</li> </ul> </li> </ul>	1	2



			Entamoebahistolytica and Entamoeba. Coli		
MID-TERM EXAM				1	2
3	<b>Protozoa</b> (Ciliate)		• Bantium coli ( Morphology ,life cycle, pathogenesis Diagnosis, prevention and control)	1	2
	<b>Protozoa</b> (intestinal and genital Flagellates)	a1, a2, a3, b1, b2, b3, d2	• Intestinal flagellates: Giardia lamblia ( Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control • Genital : Trichomonas vaginalis Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control	1	2
	<b>Protozoa</b> (blood Flagellates)	a1, a2, a3, b1, b2, b3, d2	• Leishmanias (Visceral and cutaneous) Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control • Trypanosoma (all types Morphology ,life cycle, pathogenesis ,diagnosis, prevention and control	1	2
	<b>Protozoa</b> (Sporozoa)	a1, a2, a3, b1, b2, b3, d2	• Malaria parasites (Plasmodium falciparum, vivax, ovali , malareae ) Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control	1	2
4	<b>Helminthes</b>	a1, a2, a3, b1, b2, b3, d2	• Classification of helminthes (common worms (Nematodes), schistosoma, tape worms (Trematodes ), filariasis. • Morphology ,life cycle, pathogenesis, Diagnosis, prevention and control of helminthes from each class.	2	4
5	<b>Arthropods</b>	a1, a2, a3, b1, b2, b3, d2	• classification, morphology, life cycle, pathogenicity, prevention and treatment	1	2
<b>Course Review</b>		a1, a2, a3, b1, b2, b3, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5



				Units
<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	investigation of Enatamopea histolytica& Enatamopea coli	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
2.	investigation of Giardia	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
3.	investigation of Trichomonas	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
4.	investigation of Leishmania	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
5.	investigation of Malaria spp (with preparation of blood smear)	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
6.	investigation of Ascaris&Anchyllostoma	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
7.	investigation of Teaniaspp	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
8.	investigation of H. nana	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
9.	investigation of schistosoma	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
10.	investigation of Arthropodes	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	





## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a summary report on one of the studied pathogenic parasite.	c5, c6,	4-13	3
2	<b>Group</b> : each group of students will be assigned to make a letter of education to community about infection of one of the studied parasite.	c5, c6, d1, d3,	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, , b1, , b2, b3, , , d2
2	Assignments (1 + 2)	4-13, 14	5	5	c5, c6, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	3	3	a3, b1
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2,a3, , b1, ,b2, b3 , d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, , b1, , b2, b3, , , d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, , b1, ,,c1, c2, c3, c4, c6,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b1, , b3, ,
6	Practical exam (practical)	14	20	20	a1, , b1, ,,c1, c2, c3, c4, c6,
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Kayser, Medical Microbiology & parasitology, 2005 Thieme

### 2- Essential References.

1. Michael j. Cuomo. Diagnosing medical parasites: a public health officers guide to assisting laboratory and medical officers, USAF
2. Chatterjee. Parastology
3. Parija. Text book of medical parastologyW. B. Hugo: pharmaceutical microbiology, 1998, Black well science LTD.

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecturewill not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the examwill not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of PHARMACETCAL MICROBIOLOGY II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course deals with the study of pathogenic parasites commonly infecting humans. The study concerns with mode of infections, general characters, morphology, life cycle, pathogenesis, diagnosis, prevention and control of those parasites</p>



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignement CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify and describe the microscopical/morphological features of common pathogenic parasites including protozoa , helminthes and arthropods.
2.		a2. Determine life cycle, pathogenicity, diagnosis, management of spread and treatment of common pathogenic parasites.
3.	A2	a3. Discuss the principles and technologies of parasitology applied for sampling and diagnosis of common pathogenic parasites infections
4.	B1	b1. Differentiate between similar parasites using morphological and microscopical techniques
5.	B2	b2 .Classify pathogenic parasites.
6.		b3. Relate the severity of parasitic infections to its affecting factors such as immunity.
7.	C1	c1.Handleefficiently the tools and chemicals used in parasitology Lab.
8.		c2. Operate successfully the instruments used in parasitology Lab.
9.	C2	c3 . Perform effectively the experiments and practical tasks in microbiology Lab. including microscopical investigation using standard procedures.
10.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works
11.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
12.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. work successfully in team-work.
14.	D2	d2. Show respect to life & behave in discipline during practicing practical and professional works and assignments.
15.	D3	d3. Communicate effectively with his/her colleagues.
16.	D4	d4. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	laboratory practice, Lecture	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam), Written exam , Attendance
a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance, quizzes

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1,	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes
b3	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam) Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:



Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture , laboratory practice	Written exam , Attendance, lab. attitude



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to parasites</b>	a1, a2, b1, b2, b3, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> definition &amp; Types of parasite (Ecto, endo ,obligate ,facultative )</li> <li><input type="checkbox"/> Types of host(Mechanical and biological ) and Host parasites relationship</li> <li><input type="checkbox"/> Effect of parasite on the host (Mechanical effect, effect on cell ,invasion and destruction ,inflammatory reaction to the parasite or production ,competition for host nutrient and toxic effect)</li> <li><input type="checkbox"/> Types of vector (obligate ,facultative )</li> <li><input type="checkbox"/> Source of infection (food&amp; drink, soil and water, vector ,direct contact and congenial)</li> <li><input type="checkbox"/> Mode of infection</li> <li><input type="checkbox"/> Classification of parasites (protozoa, helminthes , arthropods) classes and example for all class</li> </ul>	4	8
2	<b>Techniques for sampling and detection of parasites -</b>	a3	<ul style="list-style-type: none"> <li><input type="checkbox"/> Type of specimens (urine, stool, blood, etc.)</li> <li><input type="checkbox"/> Collection, transport and preservation of samples.</li> <li><input type="checkbox"/> Microscopic examination</li> <li><input type="checkbox"/> Direct Smear Method</li> </ul>	1	2
3	<b>Protozoa (introduction + Amoeba)</b>	a1, a2, a3, b1, b2, b3, d2	<p>General characteristic of protozoa(morphology, biological feature, multiplication ,nutrient, and locomotion )</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Classification (amoebae ,ciliate, flagellate, sporozoa)</li> <li><input type="checkbox"/> Amoebae <ul style="list-style-type: none"> <li>o Entamoebahistolytica ( Morphology ,life cycle, pathogenesis, Diagnosis, prevention and control)</li> <li>o Difference between</li> </ul> </li> </ul>	1	2





			Entamoebahistolytica and Entamoeba. Coli		
MID-TERM EXAM				1	2
3	<b>Protozoa</b> (Ciliate)		• Bantium coli ( Morphology ,life cycle, pathogenesis Diagnosis, prevention and control)	1	2
	<b>Protozoa</b> (intestinal and genital Flagellates)	a1, a2, a3, b1, b2, b3, d2	• Intestinal flagellates: Giardia lamblia ( Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control • Genital : Trichomonas vaginalis Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control	1	2
	<b>Protozoa</b> (blood Flagellates)	a1, a2, a3, b1, b2, b3, d2	• Leishmanias (Visceral and cutanouse) Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control) • Trypanosoma (all types Morphology ,life cycle, pathogenesis ,diagnosis, prevention and control	1	2
	<b>Protozoa</b> (Sporozoa)	a1, a2, a3, b1, b2, b3, d2	• Malaria parasites (Plasmodium falciparum, vivax, ovali , malareae ) Morphology ,life cycle, pathogenesis ,Diagnosis, prevention and control	1	2
4	<b>Helminthes</b>	a1, a2, a3, b1, b2, b3, d2	• Classification of helminthes (common worms (Nematodes), schistosoma, tape worms (Trematodes ), filariasis. • Morphology ,life cycle, pathogenesis, Diagnosis, prevention and control of helminthes from each class.	2	4
5	<b>Arthropods</b>	a1, a2, a3, b1, b2, b3, d2	• classification, morphology, life cycle, pathogenicity, prevention and treatment	1	2
<b>Course Review</b>		a1, a2, a3, b1, b2, b3, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5



				Units
<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	investigation of Enatamopea histolytica& Enatamopea coli	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
2.	investigation of Giardia	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
3.	investigation of Trichomonas	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
4.	investigation of Leishmania	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
5.	investigation of Malaria spp (with preparation of blood smear)	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
6.	investigation of Ascaris&Anchyllostoma	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
7.	investigation of Teaniaspp	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
8.	investigation of H. nana	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
9.	investigation of schistosoma	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
10.	investigation of Arthropodes	1	2	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

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**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a summary report on one of the studied pathogenic parasite.	c5, c6,	4-13	3
2	<b>Group</b> : each group of students will be assigned to make a letter of education to community about infection of one of the studied parasite.	c5, c6, d1, d3,	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, , b1, , b2, b3, , , d2
2	Assignments (1 + 2)	4-13, 14	5	5	c5, c6, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	3	3	a3, b1
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2,a3, , b1, ,b2, b3 , d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, , b1, , b2, b3, , , d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, , b1, ,,c1, c2, c3, c4, c6, d1, d3, d4,
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a1, , b1, ,,c1, c2, c3, c4, c6,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, b1, b1, , b3, ,
6	Practical exam (practical)	14	20	20	a1, , b1, ,,c1, c2, c3, c4, c6,
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Kayser, Medical Microbiology & parasitology, 2005 Thieme

### 2- Essential References.

1. Michael j. Cuomo. Diagnosing medical parasites: a public health officers guide to assisting laboratory and medical officers, USAF
2. Chatterjee. Parastology
3. Parija. Text book of medical parastologyW. B. Hugo: pharmaceutical microbiology, 1998, Black well science LTD.

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecturewill not be allowed to attend the lecture and will be considered absent.
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5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



توصيف مقرر: صيدلة مستشفيات

I. معلومات عامة عن المقرر :General information about the course				
PROFESSIONAL & Hospital pharmacy				
1.	اسم المقرر Course Title			
2.	Course Code and Numbe			
3.	الساعات المعتمدة Credit Hours : 3			
	الإجمالي Total	تدريب Training	عملي Practical	سمنار/تقارين Seminar/ Tutorial
	2	-		-
4.	المستوى والفصل الدراسي : Study Level and Semester			
	Fourth year, Second Semester			
5.	المتطلبات السابقة لدراسة المقرر (إن وجدت) Pre-requisites (if any)			
	Pharmaceutical Care (II) and Clinical Pharmacy I			
6.	المتطلبات المصاحبة (إن وجدت) :Co-requisites (if any)			
	Clinical Pharmacy II			
7.	البرنامج الذي يدرس له المقرر :the course is offered			
	Bachelor of pharmacy			
8.	لغة تدريس المقرر :Teaching Language			
	English			
9.	نظام الدراسة :Study System			
	obligate			
10.	معد (و) توصيف المقرر : Prepared by			
	Faculty of medicinal science			
11.	المكان الذي يدرس فيه المقرر			
	2015			
12.	تاريخ اعتماد توصيف			
13.	الجهة التي اعتمدت التوصيف : Approved by			

I. وصف المقرر :Course Description

This course covers the development, functions, organization and administration of pharmaceutical services within the hospital. This course also deals with the pharmaceutical services offered to in-patients and out-patients. It includes drug distribution, I.V. admixtures, total parenteral nutrition, and dosage calculations. Emphasis is also given to design and manufacture of formulations for hospital use including their quality assurance and packaging.

#### Overall Aims of Course:

The student shall develop an understanding of the complete process of the drug distribution system, from the purchasing and receipt of drugs by the hospital including their administration to the patient. The resident shall also develop an understanding of an intravenous admixture service, including total parenteral nutrition and chemotherapy.

#### II. أهداف المقرر Course Aims :

- 1- understanding of the complete process of the drug distribution system, from the purchasing and receipt of drugs by the hospital including administration to the patient.
- 2- knowing all legal requirements and professional standards that pertain to the drug distribution in hospitals and their contribution to patient- focused pharmacy practice
- 3- The resident shall also develop an understanding of an intravenous admixture service, including total parenteral nutrition and chemotherapy
- 4- Calculate the medicine doses and dosage regimen.

#### مخرجات التعلم المقصودة للمقرر ( ILCOs ) وربطها بمخرجات التعلم المقصودة للبرنامج ( PILOs ):

PILOs	ILCOs	م
A1	Explain hospital organization/ PTC committee functions and the professional practice management skills	a1
A5	Demonstrate proper aspect techniques and calculations for IV admixture compounding and prepare intravenous admixtures, total parenteral nutrition, and chemotherapy.	a2
A5	Understand steps involved in drug therapy monitoring and requirements for stores management and inventory control.	a3
A5	Describe all legal requirements and professional standards that pertain to the drug distribution in hospitals and their contribution to patient- focused pharmacy practice	a4
A5	Recognize the policies of MMU (Medication Management and Use) Committee.	a5
B4	Calculate the medicine doses and dosage regimen.	b1
B5	Interpret patient and clinical data, including patients records held within practice settings.	b2
B5	Interpret of prescription and other orders of medicines.	b3
C4	Adjust unit dose and Interpret/ check medication orders for completeness, appropriateness, and accuracy	c1
C4	Follow departmental procedures and pharmacy standards of practice to insure the integrity of drugs dispensed within the hospital.	c2
C5	Identify, document, evaluate and follow-up on medication errors, in accordance with hospital policy.	c3
D1	Communicate efficiently and effectively with patients and other healthcare professionals.	d1
D2	Reflect on the use of communication skills in counter prescribing.	d2

D2	Critically analyze published literature.	d3
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١- مخرجات التعلم المقصودة للمقرر ( ILCOs) : Intended Learning Outcomes of Course		
المعرفة والفهم : Knowledge and Understanding		
<p>يتم ربط مخرجات البرنامج بمخرجات المقرر</p> <p>Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)</p>		
مخرجات المقرر (معرفة وفهم) Knowledge and Understanding CILOs	مخرجات البرنامج (معرفة وفهم) Knowledge and Understanding PILOs	
بعد الانتهاء من هذا المقرر سيكون الطالب قادراً على أن: After completing this course, students would be able to:	بعد الانتهاء من هذا البرنامج سيكون الطالب قادراً على أن After completing this program, students would be able to:	
a1-Explain hospital organization/ PTC committee functions and the professional practice management skills	Recognize the principles of physical, chemical, clinical, social, behavioral, health and Pharmaceutical sciences	A1
a2-Demonstrate proper aspect techniques and calculations for IV admixture compounding and prepare intravenous admixtures, total parenteral nutrition, and chemotherapy.	demonstrate the basic knowledge of pharmacoecconomics, pharmacovigilance, policy, legislation, marketing, administration and distribution of pharmaceutical and cosmetic products as well as ethics of health care	A5
a3-Understand steps involved in drug therapy monitoring and requirements for stores management and inventory control.		
a4-Describe all legal requirements and professional standards that pertain to the drug distribution in hospitals and their contribution to patient- focused pharmacy practice		
a5-Recognize the polices of MMU (Medication Management and Use) Committee.		

المهارات الذهنية :Intellectual Skills		
<p>يتم ربط مخرجات البرنامج بمخرجات المقرر</p> <p>Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)</p>		
مخرجات المقرر (مهارات ذهنية) Intellectual Skills CILOs	مخرجات البرنامج (مهارات ذهنية) Intellectual Skills PILOs	
بعد الانتهاء من هذا المقرر سيكون الطالب قادراً على أن: After completing this course, students would be able to:	بعد الانتهاء من هذا البرنامج سيكون الطالب قادراً على أن: After completing this program, students would be able to:	



b1-Calculate the medicine doses and dosage regimen.	Plan a modern system for administration of medical foundations and merge the ethics to business during the drug marketing.	B4
b2-Interpret patient and clinical data, including patients records held within practice settings.	Interpret the prescriptions, patient and clinical data, Analysis all the encountered pharmaceutical problems and plan the strategies for their solution, to develop the health care	B5
b3-Interpret of prescription and other orders of medicines.		

المهارات العملية والمهنية :Professional and Practical Skills		
<p>يتم ربط مخرجات البرنامج بمخرجات المقرر</p> <p>Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)</p>		
مخرجات المقرر (مهارات عملية ومهنية) Professional and Practical Skills CILOs	مخرجات البرنامج (مهارات عملية ومهنية) Professional and Practical Skills PILOs	
بعد الانتهاء من هذا المقرر سيكون الطالب قادراً على أن: After completing this course, students would be able to:	بعد الانتهاء من هذا البرنامج سيكون الطالب قادراً على أن: After completing this program, students would be able to:	
c1-Adjust unit dose and Interpret/ check medication orders for completeness, appropriateness, and accuracy	Provide patient-oriented pharmaceutical care by collaboration with other health care professionals to optimize therapeutic outcomes.	C4
c2-Follow departmental procedures and pharmacy standards of practice to insure the integrity of drugs dispensed within the hospital.	Conduct research studies and utilize the results in different pharmaceutical fields.	C5
c3-Identify, document, evaluate and follow-up on medication errors, in accordance with hospital policy.		

المهارات الانتقالية (العامة) :Transferable (General) Skills		
<p>يتم ربط مخرجات البرنامج بمخرجات المقرر</p> <p>Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)</p>		
مخرجات المقرر (مهارات انتقالية عامة) Transferable (General) Skills CILOs	مخرجات البرنامج (مهارات انتقالية عامة) Transferable (General) Skills PILOs	
بعد الانتهاء من هذا المقرر سيكون الطالب قادراً على أن: After completing this course, students would be able to:	بعد الانتهاء من هذا البرنامج سيكون الطالب قادراً على أن: After completing this program, students would be able to:	
d1-Communicate efficiently and effectively with patients and other healthcare professionals.	Practice independent learning needed for continuous professional development	D1

d2-Reflect on the use of communication skills in counter prescribing.	Employ proper documentation and filing systems in different pharmaceutical fields	D2
d3-Critically analyze published literature.		

## ٢- ربط مخرجات التعلم باستراتيجيات التدريس والتقييم

### Alignment of CILOs to Teaching and Assessment Strategies

أولاً: ربط مخرجات تعلم المقرر/المعرفة والفهم باستراتيجية التدريس والتقييم:

#### First: Alignment of Knowledge and Understanding CILOs

استراتيجية التقييم Assessment Strategies	استراتيجية التدريس Teaching Strategies	مخرجات التعلم المقصودة للمقرر Knowledge and Understanding ILCOs
Oral Exam, Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam.	Lectures methods , Computer based teaching and learning, group discussion and tutorial	<p>a1-Explain hospital organization/ PTC committee functions and the professional practice management skills</p> <p>a2-Demonstrate proper aspect techniques and calculations for IV admixture compounding and prepare intravenous admixtures, total parenteral nutrition, and chemotherapy.</p> <p>a3-Understand steps involved in drug therapy monitoring and requirements for stores management and inventory control.</p> <p>a4-Describe all legal requirements and professional standards that pertain to the drug distribution in hospitals and their contribution to patient- focused pharmacy practice</p> <p>a5-Recognize the policies of MMU (Medication Management and Use) Committee.</p>

ثانياً: ربط مخرجات تعلم المقرر/المهارات الذهنية باستراتيجية التدريس والتقييم:

#### Second: Alignment of Intellectual Skills CILOs

استراتيجية التقييم Assessment Strategies	استراتيجية التدريس Teaching Strategies	مخرجات المقرر/ المهارات الذهنية Intellectual Skills CILOs
Oral Exam, Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam.	Lectures methods, Group Discussion, Problem solving sessions, brainstorming and Computer based teaching and learning	<p>b1-Calculate the medicine doses and dosage regimen.</p> <p>b2-Interpret patient and clinical data, including patients records held within practice settings.</p> <p>b3-Interpret of prescription and other orders of medicines.</p>

ثالثاً: ربط مخرجات تعلم المقرر/المهارات المهنية والعملية باستراتيجية التدريس والتقييم:

#### Third: Alignment of Professional and Practical Skills CILOs

استراتيجية التقييم Assessment Strategies	استراتيجية التدريس Teaching Strategies	مخرجات المقرر / المهارات المهنية والعملية Professional and Practical Skills CILOs
Oral Exam, Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam.	Lectures methods, Group Discussion, Problem solving sessions, brainstorming and Computer based teaching and learning	c1-Adjust unit dose and Interpret/ check medication orders for completeness, appropriateness, and accuracy c2-Follow departmental procedures and pharmacy standards of practice to insure the integrity of drugs dispensed within the hospital. c3-Identify, document, evaluate and follow-up on medication errors, in accordance with hospital policy.

رابعاً: ربط مخرجات تعلم المقرر/المهارات الانتقالية (العامة) باستراتيجية التدريس والتقييم: Fourth: Alignment of Transferable (General) Skills CILOs		
استراتيجية التقييم Assessment Strategies	استراتيجية التدريس Teaching Strategies	مخرجات المقرر / المهارات الانتقالية (العامة) Transferable (General) Skills CILOs
Oral Exam, Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam.	Lectures methods, Group Discussion, Problem solving sessions, brainstorming and Computer based teaching and learning	d1-Communicate efficiently and effectively with patients and other healthcare professionals. d2-Reflect on the use of communication skills in counter prescribing. d3-Critically analyze published literature.

I. Course Content:				
1 – Course Topics/Items:				
Order	Topic List / Units	No. of week	No. of hours	CILOs (symbols)
1	<b>Introduction</b> : Organization and Structure Organization of a hospital and hospital pharmacy - Responsibilities of a hospital pharmacist	1	2	a1, d1-3
2	Pharmacy and therapeutic committee- Hospital formulary Contents, preparation and revision of hospital formulary	1	2	a1, d1-3
3	<b>Drug Store Management and Inventory Control:</b> • Organization of a drug store • Storage conditions.	1	2	a1, a2, a3, a4
4	Purchase and Inventory Control - Principles - purchase procedures - Purchase order - Procurement and stocking	1	2	a3, a4, d1-3

5	<b>Inpatient pharmacy services:</b> Dose adjustment.	1	2	a2, b1,c1,d1-3
6	<b>Inpatient pharmacy services:</b> Dose adjustment. - Intravenous admixture (TPN) - Therapy drug monitoring (TDM)	1	2	a2, a3,b1-3,c1, c5,d1-3
7	Outpatient dispensing - methods adopted.	1	2	a4, b2,b3, b6, c2,c4, d1-3
8	Med Term Exam	1	2	a1-4, b1-3, b6, c1,c2,c4, c5
9	Drug Distribution Systems in Hospitals:	1	2	a4, b3, b4, d1-3
10	Types of drug distribution systems. - Charging policy – labeling - Dispensing of drugs to ambulatory patients. Dispensing of controlled drugs.	1	2	a4, b3, b4, b6, c2,c4, d1-3
11	<b>Polices of MMU (Medication Management and Use) Committee</b>	1	2	a5, d1-3
11	Medication Errors and Near Miss Events Reporting system	1	2	c3, d1-3
13	High Alert Medications- Medication Dispensing -	1	2	b6, c2,c4, d1-3
14	CPR Crush Cart - PARENTERAL THERAPY	1	2	a2, a3,b1-3,c1, c5,d1-3
15	Overseeing Medication Use - Distribution and Control of Narcotics	1	2	a4, b3, b4, d1-3
16	Final Term Exam		2	a1-5, b1-6, c1-5
<b>Number of Weeks /and Units Per Semester</b>			<b>16</b>	<b>32</b>

#### I. a-Teaching strategies of the course:

Lecture method, Group Discussion, Problem solving sessions, case study, Computer based teaching and learning, tutorials, brainstorming and Practical sessions.

#### b- Assessment Methods:

Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam and reports.

I. الأنشطة :Tasks and Assignments				
الدرجة Mark	الأسبوع Week due	مخرجات التعلم CILOs	النشاط / التكليف Task/Assignment	الرقم No.
10	2-10		• <b>Assignments</b>	1
10	13		• project	2

#### I. تقييم التعلم:

المرق	موضوعات التقييم	الأسبوع	الدرجة	الوزن النسبي	المخرجات التي يحققها
١.	Assignments	weekly	20	% 20	a1-5, b1-6, c1-6, d1-3
٢.	Mid-term exam	7	20	% 5	a1-4, b1-3, b6, c1,c2,c4,c5
4	Final exam	13	60	% 60	a1-5, b1-6, c1-6
	المجموع		100	%100	

I. Learning Resource (MLA style or APA style)s:	
<b>1- Required Textbook(s) ( maximum two )</b>	
	M. C. Allwood and J. T. Fell. "Textbook of Hospital Pharmacy" Blackwell Scientific Publications, Oxford. 1980.
<b>2- Recommended Readings and Reference Materials</b>	
	<ul style="list-style-type: none"> <li>W.E. Hassan "Hospital Pharmacy" 3rd ed. Lea and Febiger, Philadelphia,1974.\</li> <li>Clinical Pharmacy - Jankins, Superandio and Laticlasis.</li> </ul>
<b>3- Essential References</b>	
	Course notes (lecture notes and practical notes) prepared by teacher of the subject.
<b>4- Electronic Materials and Web Sites etc.</b>	
	Websites in international network (internet)
<b>5- Other Learning Material:</b>	
	-

I. الضوابط والسياسات المتبعة في المقرر (تحدد مركزياً من قبل عمادة الكلية)	
Class Attendance:	الحضور والغياب:
Student should attend at least 75% of the total contact hours of the subject; otherwise he/she will not be allowed to sit for the course exam and will be considered as exam failure. If the student's absence repeated due to illness, he/she will be demanded to provide a definite proof from the university Clinic. If the student's absence rate is above 25% of the course total contact hours without a reasonable excuse, he/she will be notified to study the entire course again.	1.
Tardiness:	الحضور المتأخر:
Coming late to the class, the student will be initially noticed. In case he/she repeats coming after proper time, the lecturer has the right to consider him/her absent without any warning before hand.	2.

<p><b>Exam Attendance/Punctuality:</b> ضوابط الاختبارات والامتحانات:</p> <ul style="list-style-type: none"> <li>- Student should attend the exam in time. He/she is Permitted to attend the exam half an hour late from the exam beginning, after that he/she will not be permitted to sit for the exam and be considered as absent in the exam. If he/she is absent from the exam without any acceptable excuse, he/she will get zero mark. Students who could not attend the exam due to adequate reason (illness, other reasons), will be granted another chance in the Re-exam period and this chance will be considered as his/her first chance.</li> <li>- The student is passed the exam by achieving overall marks of 50% and or above. If the mark obtained in a course is less than 50% then the student will be considered fail and he/she will be granted a second chance (Re-Exam). The course overall mark after successful re-exam will be capped at 50%.</li> <li>- Student who does not pass the re-exam will be given another chance of re-exam, again and again until he/she passes the course, except in the final year if he/she does not pass the course, he/she will be notified to study the entire course again.</li> <li>- Student who does not achieve 50% or more, he/she will be obliged to study the course.</li> </ul>	.3
<p><b>Assignments &amp; Projects:</b> المهام / التكاليف / التعميمات:</p> <p>In general, one assignment is given after each chapter of a course. The student should submit the assignment on time, mostly one week after the assignment is given.</p> <p>The weight of the assignments in the general marks will be considered 5% for a course without practical and 7% for a course have practical aspects.</p>	.4
<p><b>Cheating:</b> الغش:</p> <p>Any student caught cheating or copying home work will be punished according the code of conduct and policies used in the faculty according the university regulations.</p>	.5
<p><b>Plagiarism:</b> الانتحال:</p> <p>Plagiarism and cheating are serious offenses and may be punished by grade (fail) in exam, paper or project.</p>	.6
<p><b>Other policies:</b> سياسات أخرى:</p> <ul style="list-style-type: none"> <li>- The mobile is not allowable to be used during the lecture. It must be turned off, otherwise the student will be asked to leave the lecture room.</li> <li>- The mobile is not allowed to be taken to the exam hall.</li> <li>- Lecture notes and assignments may be given directly to students using soft or hard copy.</li> <li>- Students should familiarize themselves with all University and College Policies that cover students' rights, responsibilities and the Academic Appeal process.</li> </ul>	.7



## Course Specification

### PHARMACEUTICS IV

I. Course Identification and General Information:							
1.	Course Title:	PHARMACEUTICS IV					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( THIRD ) Year – ( SECOND ) semester					
5.	Pre –requisite (if any):	• Pharmaceutics III					
6.	Co –requisite (if any):						
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of principles and techniques of advanced and novel drug delivery systems & dosage forms.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the general properties, advantages and disadvantages of advanced and novel drug delivery systems & dosage forms.
2.	A3	a2. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types of advanced and novel drug delivery systems & dosage forms..
3.		a3. Explicit the types and roles of excipients included in different types of advanced and novel drug delivery systems & dosage forms..
4.	A4	a4. Comprehend his/her role as pharmacist in formulation of pharmaceutical dosage forms.
5.	B1	b1. Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a pharmaceutical formula.
6.	B2	b2 .Categorizeadvanced and novel drug delivery systems & dosage forms.
7.		b3. Compare between various types ofadvanced and novel drug delivery systems & dosage forms.
8.	B3	b4. Relate the selection of excipients and the method of preparation advanced and novel drug delivery systems & dosage formsto formulation, compatibility and stability factors.
9.		b5. Formulate the active ingredient and excipients into an appropriate advanced and novel drug delivery systems & dosage forms..
10.	B4	b6 . Assess the quality of the prepared advanced and novel drug delivery systems & dosage forms.
11.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceuticals Lab.
12.		c2. Operate successfully the instruments used in pharmaceuticals Lab.
13.	C2	c3. Prepare successfully pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms using standard procedures.
14.	C3	c4 .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceuticals Lab.
15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.





16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practical works
19.	D3	d3. Communicate effectively with colleagues..
20.	D4	d4. Demonstrate the ability of time management and self-learning.

+

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4, a5	Lecture, feed-back leaning	Written exam , Attendance, assignment
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	Lecture, feed-back learning	Written exam , Attendance, assignments
(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments
(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture, lab practice	Written exam , Attendance



## IV. Course Content:

### A. THEORETICAL PART

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>introduction to advanced and novel drug delivery systems</b>	a4	<ul style="list-style-type: none"> <li>The need for advanced and novel drug delivery systems <ul style="list-style-type: none"> <li>Factors related to patients convenience</li> <li>New diseases : new challenges</li> <li>Diseases resistant to classical systems</li> <li>Other factors</li> <li>Comparison between advanced and classical delivery systems</li> </ul> </li> </ul>	1	2
2	<b>Extended release systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>Definition and purposes</li> <li>Concepts of extended-release, sustained-release</li> <li>Advantages and limitations,</li> <li>Biological features affecting extended-delivery system.</li> <li>multiple units coating (pellets)</li> <li>Technology of Microencapsulation (microspheres)</li> <li>floating tablets</li> <li>bilayer and multiple layer-</li> </ul>	4	8



			tablets		
3	<b>Transdermal delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>Biological features affecting transdermal delivery system.</li> <li>Principle, components, formulation, advantages, disadvantages types and applications of : <ul style="list-style-type: none"> <li>Patches</li> <li>Phonophoresis</li> <li>Inotophoresis</li> <li>Electroporation</li> <li>Needle array and needleless injection systems</li> <li>Percutaneous enhancers</li> </ul> </li> </ul>	4	8
	mid-term exam			1	2
4	<b>advanced Sterile systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	Principle, components, formulation, advantages, disadvantages types and applications of : <ul style="list-style-type: none"> <li>Implants</li> <li>Ocuserts</li> </ul>	2	4
5	<b>advanced inhalation delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>Biological features affecting inhalation delivery system.</li> <li>Principle, components, formulation, advantages, disadvantages types and applications of : <ul style="list-style-type: none"> <li>Dry solid inhaler systems</li> </ul> </li> </ul>	1	2
6	<b>advanced intravaginal delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>Biological features affecting newer intravaginal delivery system.</li> <li>Principle, components, formulation, advantages, disadvantages and types of intravaginal systems</li> </ul>	1	2
<b>Course Review</b>		a1, a2, a3, a4, a5, b1, b2, b3, b4,	Review of the course topics by discussion session.	1	2



	d2, d4			
FINAL - EXAM			1	2
TOTAL			16	32
Number of Weeks /and Units Per Semester			16 weeks	6 Units

B - Practical Aspect:				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	Preparation of pellets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2.	Preparation of microspheres	2	4	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
3.	extended-release coated of tablets	2	4	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4.	Preparation of floating tablets	1		b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
5.	Preparation of bilayer tablets	2	4	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
6.	Preparation of transdermal patches	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
7.	study of ocuserts	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
8.	study of dry inhaler system	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total		12	24 equivalent to 12 credit hours	



Number of Weeks	12
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## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a summary of one of the studied topics.	c3, c4,	4-13	6



2	<b>Group</b> : each group of students will be assigned to provide a search-based report of one novel drug delivery systems	c3, c4, d1, d3,	14	4
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VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, b2, b3, b4, b5
2	Assignments (1 + 2)	4, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a3, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b2, b3, b4, b5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3



4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins
2. Kewal k. Jain. drug delivery systems

### 2- Essential References.

3. Ottenbrite. Polymeric drugs & drug delivery system
1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone.

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b>



	Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.





## Course Plan (Syllabus) of

### PHARMACEUTICS IV

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of principles and techniques of advanced and novel drug delivery systems & dosage forms.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the general properties, advantages and disadvantages of advanced and novel drug delivery systems & dosage forms.
2.	A3	a2. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types of advanced and novel drug delivery systems & dosage forms..
3.		a3. Explicit the types and roles of excipients included in different types of advanced and novel drug delivery systems & dosage forms..
4.	A4	a4. Comprehend his/her role as pharmacist in formulation of pharmaceutical dosage forms.
5.	B1	b1. Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a pharmaceutical formula.
6.	B2	b2 .Categorizeadvanced and novel drug delivery systems & dosage forms.
7.		b3. Compare between various types ofadvanced and novel drug delivery systems & dosage forms.
8.	B3	b4. Relate the selection of excipients and the method of preparation advanced and novel drug delivery systems & dosage formsto formulation, compatibility and stability factors.
9.		b5. Formulate the active ingredient and excipients into an appropriate advanced and novel drug delivery systems & dosage forms..
10.	B4	b6 . Assess the quality of the prepared advanced and novel drug delivery systems & dosage forms.
11.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceutics Lab.
12.		c2. Operate successfully the instruments used in pharmaceutics Lab.
13.	C2	c3. Prepare successfully pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms using standard procedures.
14.	C3	c4 .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceutics Lab.
15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.



16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practical works
19.	D3	d3. Communicate effectively with colleagues..
20.	D4	d4. Demonstrate the ability of time management and self-learning.

+

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4, a5	Lecture, feed-back leaning	Written exam , Attendance, assignment
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	Lecture, feed-back learning	Written exam , Attendance, assignments
(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments
(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture, lab practice	Written exam , Attendance



## IV. Course Content:

### A. THEORETICAL PART

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>introduction to advanced and novel drug delivery systems</b>	a4	<ul style="list-style-type: none"> <li>The need for advanced and novel drug delivery systems <ul style="list-style-type: none"> <li>Factors related to patients convenience</li> <li>New diseases : new challenges</li> <li>Diseases resistant to classical systems</li> <li>Other factors</li> <li>Comparison between advanced and classical delivery systems</li> </ul> </li> </ul>	1	2
2	<b>Extended release systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>Definition and purposes</li> <li>Concepts of extended-release, sustained-release</li> <li>Advantages and limitations,</li> <li>Biological features affecting extended-delivery system.</li> <li>multiple units coating (pellets)</li> <li>Technology of Microencapsulation (microspheres)</li> <li>floating tablets</li> <li>bilayer and multiple layer-tablets</li> </ul>	4	8
3	<b>Transdermal delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>Biological features affecting transdermal delivery system.</li> <li>Principle, components, formulation, advantages,</li> </ul>	4	8



			disadvantages types and applications of : ○ Patches ○ Phonophoresis ○ Inotophoresis ○ Electroporation ○ Needle array and needleless injection systems ○ Percutaneous enhancers		
	mid-term exam			1	2
4	<b>advanced Sterile systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	Principle, components, formulation, advantages, disadvantages types and applications of : ○ Implants ○ Ocuserts	2	4
5	<b>advanced inhalation delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>Biological features affecting inhalation delivery system.</li> <li>Principle, components, formulation, advantages, disadvantages types and applications of : ○ Dry solid inhaler systems</li> </ul>	1	2
6	<b>advanced intravaginal delivery systems</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	<ul style="list-style-type: none"> <li>Biological features affecting newer intravaginal delivery system.</li> <li>Principle, components, formulation, advantages, disadvantages and types of intravaginal systems</li> </ul>	1	2
<b>Course Review</b>		a1, a2, a3, a4, a5, b1, b2, b3, b4, d2, d4	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Couse Intended Learning Outcomes CILOs</b>
1.	Preparation of pellets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2.	Preparation of microspheres	2	4	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
3.	extended-release coated of tablets	2	4	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4.	Preparation of floating tablets	1		b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
5.	Preparation of bilayer tablets	2	4	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
6.	Preparation of transdermal patches	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
7.	study of ocuserts	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
8.	study of dry inhaler system	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a summary of one of the studied topics.	c3, c4,	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report of one novel drug delivery systems	c3, c4, d1, d3,	14	4



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, b2, b3, b4, b5
2	Assignments (1 + 2)	4, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a3, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b2, b3, b4, b5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3





Total	40	40 %	
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## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins
2. Kewal k. Jain. drug delivery systems

### 2- Essential References.

1. Ottenbrite. Polymeric drugs & drug delivery system
2. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone.

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b>



	Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.
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## Course Specification

### PHARMACEUTICS III

I. Course Identification and General Information:							
1.	Course Title:	PHARMACEUTICS III					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( THIRD ) Year – ( FIRST ) semester					
5.	Pre –requisite (if any):	• Pharmaceutics II					
6.	Co –requisite (if any):	None					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

II. Course Description:
The course deals with the study of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the general properties, advantages and disadvantages of pharmaceutical solid dosage forms including tablets and capsules and sterile dosage forms including parenteral and ophthalmic preparations .
2.	A3	a2. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
3.		a3. Explicit the types and roles of excipients included in different types of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
4.	A4	a4. Comprehend his/her role as pharmacist in formulation of pharmaceutical dosage forms.
5.	B1	b1. Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a pharmaceutical formula.
6.	B2	b2 .Categorize pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
7.		b3. Compare between various types of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
8.	B3	b4. Relate the selection of excipients and the method of preparation of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .to formulation, compatibility and stability factors.
9.		b5. Formulate the active ingredient and excipients into an appropriate pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
10.	B4	b6 . Assess the quality of the prepared pharmaceutical solid dosage forms including tablets and capsules and sterile ophthalmic preparations
11.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceuticals Lab.

12.		c2. Operate successfully the instruments used in pharmaceuticals Lab.
13.	C2	c3. Prepare successfully pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms using standard procedures.
14.	C3	c4 .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceuticals Lab.
15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practical works
19.	D3	d3. Communicate effectively with colleagues..
20.	D4	d4. Demonstrate the ability of time management and self-learning.

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2, a3	Lecture	Written exam , Attendance
a4	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2, b3, b4	Lecture	Written exam , Attendance, quizzes

<b>b5</b>	<b>Lecture</b>	<b>Written exam , Attendance</b>
<b>b6</b>	<b>laboratory practice</b>	<b>Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)</b>
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1, c2, c3, c4</b>	<b>laboratory practice</b>	<b>Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)</b>
<b>c5</b>	<b>Feed-back learning, Group-project</b>	<b>Assignments</b>
<b>c6</b>	<b>laboratory practice, Feed-back learning</b>	<b>Practical assessment (Lab. attendance, reporting, practical exam), Assignments</b>
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d2, d3</b>	<b>laboratory practice, Feed-back learning, group project</b>	<b>Practical assessment (Lab. attendance, attitude, practical exam), Assignments</b>
<b>d4</b>	<b>laboratory practice, Feed-back learning</b>	<b>Practical assessment (Lab. attendance, accomplishment, practical exam) , Assignments</b>

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Pharmaceutical solid dosage forms (Tablets)</b>	a1, a2, a3, a4, b2, b3, b4, b5	<input type="checkbox"/> Introduction <input type="checkbox"/> Advantages and disadvantages. <input type="checkbox"/> Types of compressed tablets. <input type="checkbox"/> Tableting methods o Direct compression o Dry granulation o Wet granulation <input type="checkbox"/> Technology of production of granules on large scale by various techniques. <input type="checkbox"/> Tablet excipients <input type="checkbox"/> Large scale production of tablets. <input type="checkbox"/> Tablet press machines <input type="checkbox"/> Problems encountered during tablet formulation. <input type="checkbox"/> Standards quality control tests for tablets. <input type="checkbox"/> Tablet coating ▪ Types of coating ▪ Film forming materials ▪ Common polymers used for tablet coating.	4	8
2	<b>Pharmaceutical solid dosage forms (capsules)</b>	a1, a2, a3, a4, b2, b3, b4, b5	<b>(i) Hard gelatin capsules</b> <ul style="list-style-type: none"> <li>Advantages and disadvantages</li> <li>Composition of capsule shell</li> <li>types of capsule fill</li> <li>Selection of capsule size.</li> <li>Excipients used in hard gelatin capsule formulation.</li> <li>Enteric coating of capsules.</li> <li>Capsule filling process.</li> <li>Storage of hard gelatin capsules.</li> </ul> <b>(ii) Soft gelatin capsules</b>	3	6

			<ul style="list-style-type: none"> <li>• Advantage and disadvantages.</li> <li>• Capsule shell composition.</li> <li>• types of capsule fill</li> <li>• Shapes and sizes.</li> <li>• Soft gelatin capsule formulation.</li> <li>• capsule filling process</li> <li>• specific properties: O<sub>2</sub> impermeability, water content</li> </ul>		
<b>Mid-semester exam</b>				1	2
3	<b>Sterile pharmaceutical dosage forms</b> (Introduction)	a1, a2, a3, a4, b2, b3, b4, b5	<b>Differences between sterile &amp; non-sterile dosage forms :</b> <ul style="list-style-type: none"> <li>• Definition of sterility, sterilization, preservation, pyrogenicity, pyrogen-free</li> <li>• Review of sterilization methods and preservation of dosage forms</li> <li>• Aseptic techniques</li> <li>• Sources of contamination and methods of prevention</li> <li>• Design of aseptic area , Laminar flow benches services and maintenance)</li> <li>• Isotonicity of sterile preparations and methods of adjustment</li> </ul>	1	2
4	<b>Sterile pharmaceutical dosage forms</b> (Parenteral preparations)	a1, a2, a3, a4, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>• Preformulation factors <ul style="list-style-type: none"> <li>○ Route of administration of injection</li> <li>○ Water for injection</li> <li>○ Non-aqueous vehicles</li> </ul> </li> <li>• Formulation details <ul style="list-style-type: none"> <li>○ types of parenteral preparations ( solutions, suspension, emulsions, powders) , factors affecting formulation : the vehicles, osmotic pressure, pH, specific gravity,</li> <li>○ Formulation of Infusion fluids</li> </ul> </li> <li>• Prefilling &amp; filling</li> </ul>	3	6



			<ul style="list-style-type: none"> <li>○ Types Containers (ampoules, vials) and closures selection</li> <li>○ Washing of containers and closures</li> <li>○ Filling and closing ampoules and vials</li> <li>○ Equipments for large scale manufacture and evaluation of particulate matter.</li> </ul>		
5	<b>Sterile pharmaceutical dosage forms</b> (Ophthalmic preparations)	a1, a2, a3, a4, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>• Anatomical features of the eye</li> <li>• Formulation , preparation , sterilization and preservation of Ophthalmic dosage forms : (Eye drops) : solution, suspension., Eye washes Ophthalmic semisolids ( ointments, creams, gels).</li> <li>• Filling</li> <li>• Examples of drugs used to treat certain eye diseases</li> <li>• Ocuserts : composition, formulation, use</li> </ul>	2	4
	<b>Course Review</b>	a1, a2, a3, a4, b2, b3, b4, b5	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Couse Intended Learning Outcomes CILOs</b>
1.	Preparation of tablets using wet granulation method : paracetamol tablets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2.	Preparation of tablets using wet granulation method : mefenamic acid tablets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
3.	Preparation of tablets using direct compression method : aspirin tablets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4.	film-coating of tablets mefenamic acid	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
5.	Preparation of hard gelatin capsules (Manual): aspirin	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
6.	Preparation of hard gelatin capsules (Manual): paracetamol	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
7.	Preparation of I.V. admixtures : DNS + vitamin C + vitamin B complex	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
8.	Preparation of parenteral solutions from parenteral powders : reconstitution of cefuroxime sodium vial	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
9.	Preparation of Glycerin suppositories.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
10.	Preparation of sterile NaCl eye wash.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.</p> <p>The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to present a search report supported with images on 5 trade names (commercial preparations) of the studied dosage forms	c5, c6, d4	4-13	3
2	<b>Group</b> :every group is assigned to present an illustrating videos on lab. And industrial preparation of 3 types of studies dosage forms.	c5, c6, d1, d4	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, b2, b3, b4, b5
2	Assignments (1 + 2)	4, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a3, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b2, b3, b4, b5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	

## VIII. Learning Resources

### 1- Required Textbook(s) ( maximum two ).

1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
2. Ansel`s Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 2- Essential References.

1. Rawlins. Bentley s of text book of pharmaceutics
2. Kasture pharmaceutics
3. Raje. pharmaceutics
4. Raph. practical pharmaceutics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of PHARMACEUTICS III

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the general properties, advantages and disadvantages of pharmaceutical solid dosage forms including tablets and capsules and sterile dosage forms including parenteral and ophthalmic preparations .
2.	A3	a2. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
3.		a3. Explicit the types and roles of excipients included in different types of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
4.	A4	a4. Comprehend his/her role as pharmacist in formulation of pharmaceutical dosage forms.
5.	B1	b1. Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a pharmaceutical formula.
6.	B2	b2 .Categorize pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
7.		b3. Compare between various types of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
8.	B3	b4. Relate the selection of excipients and the method of preparation of pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .to formulation, compatibility and stability factors.
9.		b5. Formulate the active ingredient and excipients into an appropriate pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms including parenteral and ophthalmic preparations .
10.	B4	b6 . Assess the quality of the prepared pharmaceutical solid dosage forms including tablets and capsules and sterile ophthalmic preparations
11.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceuticals Lab.

12.		c2. Operate successfully the instruments used in pharmaceuticals Lab.
13.	C2	c3. Prepare successfully pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms using standard procedures.
14.	C3	c4 .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceuticals Lab.
15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
16.	C4	c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practical works
19.	D3	d3. Communicate effectively with colleagues..
20.	D4	d4. Demonstrate the ability of time management and self-learning.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2, a3	Lecture	Written exam , Attendance
a4	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2, b3, b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture	Written exam , Attendance



b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	Feed-back learning, Group-project	Assignments
c6	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d2, d3	laboratory practice, Feed-back learning, group project	Practical assessment (Lab. attendance, attitude, practical exam), Assignments
d4	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) , Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Pharmaceutical solid dosage forms (Tablets)</b>	a1, a2, a3, a4, b2, b3, b4, b5	<input type="checkbox"/> Introduction <input type="checkbox"/> Advantages and disadvantages. <input type="checkbox"/> Types of compressed tablets. <input type="checkbox"/> Tableting methods <ul style="list-style-type: none"> <li>o Direct compression</li> <li>o Dry granulation</li> <li>o Wet granulation</li> </ul> <input type="checkbox"/> Technology of production of granules on large scale by various techniques. <input type="checkbox"/> Tablet excipients <input type="checkbox"/> Large scale production of tablets. <input type="checkbox"/> Tablet press machines <input type="checkbox"/> Problems encountered during tablet formulation. <input type="checkbox"/> Standards quality control tests for tablets. <input type="checkbox"/> Tablet coating <ul style="list-style-type: none"> <li>▪ Types of coating</li> <li>▪ Film forming materials</li> <li>▪ Common polymers used for tablet coating.</li> </ul>	4	8
2	<b>Pharmaceutical solid dosage forms (capsules)</b>	a1, a2, a3, a4, b2, b3, b4, b5	<b>(i) Hard gelatin capsules</b> <ul style="list-style-type: none"> <li>• Advantages and disadvantages</li> <li>• Composition of capsule shell</li> <li>• types of capsule fill</li> <li>• Selection of capsule size.</li> <li>• Excipients used in hard gelatin capsule formulation.</li> <li>• Enteric coating of capsules.</li> <li>• Capsule filling process.</li> <li>• Storage of hard gelatin capsules.</li> </ul> <b>(ii) Soft gelatin capsules</b>	3	6

			<ul style="list-style-type: none"> <li>• Advantage and disadvantages.</li> <li>• Capsule shell composition.</li> <li>• types of capsule fill</li> <li>• Shapes and sizes.</li> <li>• Soft gelatin capsule formulation.</li> <li>• capsule filling process</li> <li>• specific properties: O<sub>2</sub> impermeability, water content</li> </ul>		
<b>Mid-semester exam</b>				1	2
3	<b>Sterile pharmaceutical dosage forms</b> (Introduction)	a1, a2, a3, a4, b2, b3, b4, b5	<b>Differences between sterile &amp; non-sterile dosage forms :</b> <ul style="list-style-type: none"> <li>• Definition of sterility, sterilization, preservation, pyrogenicity, pyrogen-free</li> <li>• Review of sterilization methods and preservation of dosage forms</li> <li>• Aseptic techniques</li> <li>• Sources of contamination and methods of prevention</li> <li>• Design of aseptic area , Laminar flow benches services and maintenance)</li> <li>• Isotonicity of sterile preparations and methods of adjustment</li> </ul>	1	2
4	<b>Sterile pharmaceutical dosage forms</b> (Parenteral preparations)	a1, a2, a3, a4, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>• Preformulation factors <ul style="list-style-type: none"> <li>○ Route of administration of injection</li> <li>○ Water for injection</li> <li>○ Non-aqueous vehicles</li> </ul> </li> <li>• Formulation details <ul style="list-style-type: none"> <li>○ types of parenteral preparations ( solutions, suspension, emulsions, powders) , factors affecting formulation : the vehicles, osmotic pressure, pH, specific gravity,</li> <li>○ Formulation of Infusion fluids</li> </ul> </li> <li>• Prefilling &amp; filling</li> </ul>	3	6

			<ul style="list-style-type: none"> <li>Types Containers (ampoules, vials) and closures selection</li> <li>Washing of containers and closures</li> <li>Filling and closing ampoules and vials</li> <li>Equipments for large scale manufacture and evaluation of particulate matter.</li> </ul>		
5	<b>Sterile pharmaceutical dosage forms</b> (Ophthalmic preparations)	a1, a2, a3, a4, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>Anatomical features of the eye</li> <li>Formulation , preparation , sterilization and preservation of Ophthalmic dosage forms : (Eye drops) : solution, suspension., Eye washes Ophthalmic semisolids ( ointments, creams, gels).</li> <li>Filling</li> <li>Examples of drugs used to treat certain eye diseases</li> <li>Ocuserts : composition, formulation, use</li> </ul>	2	4
	<b>Course Review</b>	a1, a2, a3, a4, b2, b3, b4, b5	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Couse Intended Learning Outcomes CILOs</b>
1.	Preparation of tablets using wet granulation method : paracetamol tablets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2.	Preparation of tablets using wet granulation method : mefenamic acid tablets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
3.	Preparation of tablets using direct compression method : aspirin tablets	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4.	film-coating of tablets mefenamic acid	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
5.	Preparation of hard gelatin capsules (Manual): aspirin	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
6.	Preparation of hard gelatin capsules (Manual): paracetamol	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
7.	Preparation of I.V. admixtures : DNS + vitamin C + vitamin B complex	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
8.	Preparation of parenteral solutions from parenteral powders : reconstitution of cefuroxime sodium vial	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
9.	Preparation of Glycerin suppositories.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
10.	Preparation of sterile NaCl eye wash.	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to present a search report supported with images on 5 trade names (commercial preparations) of the studied dosage forms	c5, c6, d4	4-13	3
2	<b>Group</b> :every group is assigned to present an illustrating videos on lab. And industrial preparation of 3 types of studies dosage forms.	c5, c6, d1, d4	14	2

VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, b2, b3, b4, b5
2	Assignments (1 + 2)	4, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a3, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b2, b3, b4, b5
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	

## VIII. Learning Resources

### 1- Required Textbook(s) ( maximum two ).

1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
2. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 2- Essential References.

1. Rawlins. Bentley s of text book of pharmaceutics
2. Kasture pharmaceutics
3. Raje. pharmaceutics
4. Raph. practical pharmaceutics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.





## Course Specification

### Psycho-sociology for health professional

I. Course Identification and General Information:							
1.	Course Title:	Psycho-sociology for health professional					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( THIRD ) Year – ( 2 <sup>ND</sup> ) semester					
5.	Pre –requisite (if any):	NONE					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course focuses on study of development of human personality according to various psychological and the importance of the caring environment for the health of patients.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the schools of psychology and the role of psychology in management of modern diseases
2.		a2. Define the essential psychological concepts such as mental ability, motives and emotions
3.		a3. Determine the basic human psychological needs and the emotional needs of ill people.
4.		a4. Describe various types of personalities and how to deal with each type.
5.	A3	a4. Discuss the stages in development of human personality.
6.	A4	a5. Comprehend his/her roles as a health care professional in dealing with various personalities of patients and grasp their emotional needs.
7.	B2	b1 . Compare between psychiatry, behavior medicine and psychology
8.		b2. Classify personalities of human into various categories.
9.		b3. Differentiate between psychopathic and normal persons.
10.	B4	b4 . Assess the emotional needs of patients. select
11.	C4	c1 . Present his/her thoughts , search for information and report works effectively using language.
12.	D1	d1. Work successfully in team-work.
13.	D2	d2. Show respect to life.
14.	D3	d3. Demonstrate the ability of effective communication.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture, feed-back learning	written exam , assignment
a4, a5	Lecture	written exam

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning	Teaching strategies	Assessment Strategies
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Outcomes		
b1, b2, b3, b4	lecture ,Feed-back learning	Written exam , assignment, quiz
<b>(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Feed-back learning ,Group-project.	assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Group-project , feed-back learning	assignment
d2	lecture, Group-project, feed-back learning	Written exam , assignment
d3.	Group-project, feed-back learning	assignment



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to psychology</b>	a1	<ul style="list-style-type: none"> <li>Definition, historical progress</li> <li>Purposes of psychology</li> <li>schools of psychology.</li> </ul>	2	4
2	<b>Human needs and drives</b>	a3	<ul style="list-style-type: none"> <li>Basic human needs and biological or primary drives, Secondary social and psychological drives.</li> </ul>	2	4
3	<b>Psychology concepts</b>	a2	<ul style="list-style-type: none"> <li>Mental ability , Motor skills, motives</li> <li>Sensation , Conceit , emotion</li> </ul>	2	4
MID-TERM EXAM				1	2
4	<b>Personality</b>	a4,a5, b2, b3, b4, d2	<ul style="list-style-type: none"> <li>Definition and dimensional types</li> <li>Growth and environment factors</li> <li>Relationship between achievement of development stages goals and basic structure of personality.</li> <li>Types of personalities</li> <li>Methods of assessment</li> <li>Dealing and communication with various types of personalities</li> <li>Differences between psychopathic and normal persons.</li> </ul>	4	8
5	<b>Medical psychology</b>	b1, d2	<ul style="list-style-type: none"> <li>Fear, anxiety and depression associated with Illness.</li> <li>Emotional needs of ill persons</li> <li>Psychological health and behavioral Medicine.</li> <li>Psychiatry</li> </ul>	3	6
<b>Course Review</b>		a1, a2, a3, a4,a5, b2, b3, b4, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	5 units Units



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search-based report on one of the subtopics studies such as : psychology schools and concepts.	a1, b1, b2, b3, c1	4-13	6
2	<b>Group</b> : each group of students will be assigned to do a search report on how to deal with one of the following : <ul style="list-style-type: none"> <li>Mentally disables</li> <li>Nervous personalities</li> <li>Depressed patients</li> <li>Self-proud persons</li> </ul>	c1, d1, d2, d3	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, b1, b2, b3, b4, d2
2	Assignments (1 + 2)	4-13, 14	10	10	a1, b1, b2, b3, c1, d1, d2, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, b1, b2, b3, b4, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

1- Required Textbook(s) ( maximum two ).

1.

2- Essential References.

2.

3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



### Course specification of: Pharmaceutical Biochemistry III

1.	Course Title :					Pharmaceutical Biochemistry III
2.	Course Code and Number:					
3.	Lecture	Training	Practical	Seminar/ Tutorial	Total	Credit Hours: 2
	2	-	-	-	2	
4.	Study Level and Semester:					Third Year –2 <sup>nd</sup> Semester
5.	Pre-requisites (if any):					General Chemistry, Pharmaceutical Biochemistry I, and II
6.	None Co-requisites (if any):					None
7.	Program in which the course is offered:					Bachelor of Pharmacy
8.	Teaching Language:					English
9.	Study System:					Obligatory attendance
10.	Prepared by					Dr. Ali Alhawery
11.	Location of teaching the course:					Yemen University
12.	Date of Approval :					2015
13.	Approved by:					
I. Course Description :						
The course deals with the study of the hemoprotiens, biological oxidation & oxidative phosphorylation, metabolism of xenobiotic substances, oxidative stress, vitamins and minerals.						

Alignment CILOs to PILOs		
PILOs	ILCOs	٢
A1	a1. Know the hemoproteins, their structures and metabolism as well as the biochemical fate .	a1
A2	a2. Understand the biological oxidation and oxidative phosphorylation.	a2
A3	a3. Discuss the phases of xenobiotic metabolism , source & types of free radicals as well as the damage that will result from the accumulation of free radicals.	a3



<b>B1</b>	b1. Interpret certain body diseases based on disturbances in levels of body biochemicals	<b>b1</b>
<b>B2</b>	b2 . Solve biochemical problems related to nomenclature, synthetic and metabolic reactions.	<b>b2</b>
	b3. Classify biochemicals into various categories.	<b>b3</b>
	b4. Compare between different types of biochemical synthesis or metabolic reactions based on their income and outcomes products.	<b>b4</b>
<b>B3</b>	b5. Predict the outcomes of biochemical reactions.	<b>b5</b>
<b>C1</b>	c1.Handleefficiently the tools and chemicals used in biochemistry Lab.	<b>c1</b>
	c2. Operate successfully the instruments used in biochemistry Lab.	<b>c2</b>
<b>C2</b>	c3 . Perform efficiently experiments and practical tasks for in vitro and in vivo identifications of biochemical compounds using standard procedures.	<b>c3</b>
	c4. Take and prepare human samples to biochemistry investigations using standard procedures.	<b>c4</b>
<b>C3</b>	c5 .Take the required safety criteria during performing practical works in biochemistry Lab.	<b>c5</b>
<b>C4</b>	c6 .Appropriately search for information and also present and report his/her work using various source of information and media technologies..	<b>c6</b>
	c7. Use effectively symbols and figures and drawing to express chemical reactions and synthesis	<b>c7</b>
<b>D1</b>	d1. Work successfully in team-work.	<b>d1</b>
<b>D2</b>	d2. Show respect to life & behave in discipline during performing practical works in biochemistry Lab.	<b>d2</b>
<b>D3</b>	d3. Communicate effectively with his/her colleagues during performing practical works in in biochemistry Lab.	<b>d3</b>
<b>D4</b>	d4. Demonstrate time management and problem solving skills.	<b>d4</b>

## 1- Alignment of CILOs to Teaching and Assessment Strategies

### First: Alignment of Knowledge and Understanding with the CILOs

Knowledge and Understanding ILCOs	Teaching Strategies	Assessment Strategies
a1	Lecture,	written exam , assignment

a2	Lecture,, feed-back learning	written exam , quizzes
a3	Lecture, feed-back learning, Group-project	written exam, ,assignment

Second: Alignment of Intellectual Skills with the CILOs		
Intellectual Skills CILOs	Teaching Strategies	Assessment Strategies
b1	lecture, group-project, feed-back learning	. Written exam, assignments
b2,b3,b4	Lecture, , feed-back learning	written exam , quizzes
b5	Lecture,, feed-back learning	written exam, quizzes

Third: Alignment of Professional and Practical Skills with the CILOs		
Professional and Practical Skills CILOs	Teaching Strategies	Assessment Strategies
c1, c2	Lecture, , feed-back learning	Written exam, assignments
c3, c4	Lecture, , feed-back learning	Written exam, assignments

c5	Lecture, , feed-back learning	written exam, quizzes
c6, c7	Group-project, feed-back learning	Written- exam , , assignments

Fourth: Alignment of Transferable (General) Skills with the CILOs		
Transferable (General) Skills CILOs	Teaching Strategies	Assessment Strategies
d1	Group-project , feed-back learning	Written- exam , , assignments
d2	lecture	Written exam, quizzes
d3	Lecture, , feed-back learning	Written exam, assignments
d4	Lecture, , feed-back learning	Written exam, assignments

No.	Course Topics/Units	Sub-topics	No. of Weeks	Contact hours	CILOs
1	<b>Hemoprotein Metabolism</b>	<ul style="list-style-type: none"> <li>- Examples of Hemoproteins, Structure of heme, Structure of porphyrins, Heme synthesis and Its Regulation, and Metabolism of hemoglobin.</li> <li>-Types of Hemoglobin, Factors affecting hemoglobin oxygen binding, and Catabolism of Hemoglobin.</li> <li>- Bilirubin Metabolism, Hyperbilirubinemia and Jaundice, and Types of Hyperbilirubinemia (jaundice).</li> </ul>	3	6	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
2	<b>Biological Oxidation and Oxidative Phosphorylation</b>	<ul style="list-style-type: none"> <li>- Introduction, Principals of Reduction/Oxidation (Redox) Reactions, Importance of Biologic Oxidation.</li> <li>-Redox Potential (or electron affinity), Respiratory Chain, Components of Respiratory Chain, and The Sequence of Electron Transfer through Components of Respiratory Chain.</li> <li>-Inhibitors of Respiratory Chain, Coupling Mechanisms, ATP Production, Oxidative Phosphorylation, and Chemiosmotic Hypothesis.</li> <li>- Substrate level Phosphorylation, Regulation of Oxidative Phosphorylation, Un-couplers (Inhibitors) of Oxidative Phosphorylation, and Enzymes of Oxidation-Reduction Reactions (Or, Oxidoreductases).</li> </ul>	2	4	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
3	<b>Metabolism of Xenobiotics and Oxidative Stress</b>	<ul style="list-style-type: none"> <li>-Phases of Xenobiotic Metabolism, Cytochrome P450 Species (cytp450s), and Fate (or Biological Hazards) of Xenobiotic Metabolism.</li> <li>-Free Radicals, Types of Free Radicals, and Sources of Free Radicals within Cells.</li> <li>- Types of Damage Caused by Free Radicals, Oxidative Stress, Diseases Involving Free Radicals, Antioxidants, and Superoxide Metabolism.</li> </ul>	2	4	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
	<b>Midterm Exam</b>		1	2	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
4	<b>Vitamins-I</b>	-Definitions, characters, classifications	1	2	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2

5	Vitamins-II	-Vitamin E, D and K.	1	2	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
6	Vitamins-III	-Vitamins B2, B6, B5, B6 and vitamin C.	2	4	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
7	Minerals-I	-Potassium, Sodium, Zinc	1	2	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
8	Minerals-II	-Calcium, Phosphorus, and Iodide.	1	2	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
Revision			1	2	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
Final exam			1	2	
Total number of weeks and hours			16	32	

## I. Teaching Strategies

- **Lecture:** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom  
The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming:** It depends on stimulation of the student's brain through a group of questions &/or **Concepts map:** which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- **Feed-back learning:** students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation.
- **Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills.

## II. Tasks and Assignments :

No.	Task/Assignment	CILOs	Week due	Mark
1	<b>Individual:</b> the teacher provide the students with biochemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b2, c5, d4	4-13	3
2	<b>Group :</b> each group of students will be assigned to present a search report on one pathological condition related to disturbances in biochemical levels in the body.	b1, d1, , c6	14	2

## III. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course (CILOs)
1	Attendance	1 - 15	5	5 %	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
2	Assignments (1 + 2)	4-13, 14	10	10 %	b1, b2, c5, c6, d1, d4,
3	Quiz 1 + Quiz 2	7, 12	5	5 %	b2, b5
4	Mid-semester	7	20	20 %	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
5	Final exam ( written exam)	17	60	60 %	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
TOTAL			100	100 %	

#### Essential References-not less than 4

1. Pamela C. Champe, Lippincott's illustrated review in Biochemistry, 2010, Lippincott William & Wilkins
2. Hiram f. Gilbert , Basic concepts in biochemistry ; a student's survival guide, 2000, McGraw-Hill
3. Vyas . Pharmaceutical biochemistry
4. [www.en.wikipedia.org/](http://www.en.wikipedia.org/)

V.	IV. Course Policies:
1	<b>Class Attendance:</b> Student should attend at least 75% of the total contact hours of the subject; otherwise he/she will not be allowed to sit for the course exam and will be considered as exam failure. If the student's absence repeated due to illness, he/she will be demanded to provide a definite proof from the university Clinic. If the student's absence rate is above 25% of the course total contact hours without a reasonable excuse, he/she will be notified to study the entire course again.
2	<b>Tardiness:</b> Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course according the university regulations.
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules

7	<p><b>Other policies:</b></p> <ul style="list-style-type: none"> <li>- The mobile is not allowed to be used during the lecture. It must be turned off, otherwise the student will be asked to leave the lecture room.</li> <li>- The mobile is not allowed to be taken to the exam hall.</li> <li>- Lecture notes and assignments may be given directly to students using soft or hard copy.</li> <li>- Students should familiarize themselves with all University and College Policies that cover students' rights, responsibilities and the Academic Appeal process.</li> </ul>
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## Course Specification

### **BIOPHARMACY & PHARMACOKINETICS I**

<b>I. Course Identification and General Information:</b>					
1.	Course Title:	<b>BIOPHARMACY &amp; PHARMACOKINETICS I</b>			
2.	Course Code & Number:				
3.	Credit hours:	C.H			TOTAL
		Theoretical		P.	
		L.	Tut.	S.	
		2	-	-	2
4.	Study level/ semester at which this course is offered:	( FOURTH ) Year – ( 1ST ) semester			
5.	Pre –requisite (if any):	• Pharmaceutics I , II, III			
6.	Co –requisite (if any):	NONE			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10.	Prepared By:				
11.	Date of Approval	<b>2015</b>			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study the interrelationship of the physicochemical properties of the drug, the dosage form, the biological factors with the rate and extent of drug availability at the site of action and accordingly its therapeutic efficacy. The course also provides the students with essential knowledge of biopharmaceutical studies.





### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Provide clinically-based examples of drugs whose bioavailability were affected by various factors.
2.		a2. Explain the biological steps of drugs bioavailability and the laws/equations governing them.
3.		a3. Determine the physicochemical, biological and pharmaceutical factors that affect drug bioavailability.
4.		a4. Recognize the role of excipients and the type of dosage forms in drug bioavailability.
5.	A3	a5. Define biopharmaceutics, bioavailability and bioequivalence.
6.		a6. Explicit the biopharmaceutical classification system (BCS) of drugs.
7.	A4	a7. Comprehend his/her role as a pharmacist in assessment and improvement of drug bioavailability and hence drugs therapeutic efficacy.
8.	B1	b1. Express drug bioavailability using rate and extent expression.
9.		b2. Interpret figures and graphs of biopharmaceutical studies.
10.	B2	b3. Classify drugs biopharmaceutically.
11.		b4. Compare between various biological steps involved in drug bioavailability.
12.	B3	b5. Relate between in vitro and in vivo biopharmaceutical data.
13.	B4	b6. Assess drug bioavailability based on in vivo or in vitro data
14.		b7. Select the most appropriate approach to test the bioavailability and its various step.
15.	C2	c1. Apply biopharmaceutics knowledge to recommend patients /physicians of the best approaches of enhancing drug bioavailability.
16.		c2. Choose the best drug/formulation based on their bioavailability studies data.
17.	C4	c3. Search efficiently for information using documented and electronic sources of information.
18.		c4. Present and report his/her work correctly using appropriate writing rules and technologies media.
19.	D1	d1. Work successfully in team-work.



20.	D2	d2. Show respect to life& behave in discipline during practicing practical and professional works and assignments.
21.	D3	d3. Communicate effectively with colleagues.
22.	D4	d4. Demonstrate the ability of time management and self-learning.

+

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, , a2, a3	Lecture, feed-back leaning	Written exam , Attendance, assignment
a5, a6	Lecture	Written exam , Attendance
a7	Lecture	Written exam , Attendance
(b) Alignment Course Intended Learning Outcomes (CILOs) ofIntellectual Skillsto Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam , Attendance, assignments
b3, b4, b5	Lecture	Written exam , Attendance
b6, b7	Lecture	Written exam , Attendance
(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2	Lecture, feed-back leaning	Written exam , Attendance , assignments, quizzes
c3, c4	feed-back learning, Group-project	Assignments
(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
	Feed-back learning	Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to biopharmaceutics</b>	a2, a3, a5, a7, b1, b2, c1, d2	<input type="checkbox"/> Definition and significance of biopharmaceutics and bioavailability. <input type="checkbox"/> relation of biopharmaceutics to other pharmaceutical sciences <input type="checkbox"/> correlation between bioavailability & drug efficacy <input type="checkbox"/> Expressions of drug bioavailability <input type="checkbox"/> factors affecting bioavailability <input type="checkbox"/> Introduction to steps for drug bioavailability	1	2
2	<b>Bioavailability steps</b>	a1, a2, a7, b1, b2, b4, b6, b7, c1, d2	<b>Drug Release</b> Definition, significance, Expression parameters (cumulative % release, drug release rate) <input type="checkbox"/> Mechanisms and governing equations : Fick's law, Higuchi equation, Peppas equation (matrix diffusion, membrane diffusion, Fickian, Non-Fickian, controlled) <b>Drug dissolution</b> <input type="checkbox"/> Definition, significance, Expression parameters (cumulative % dissolved, dissolution rate), Mechanisms and governing equations : Noyes-Whitney equation	1	2
		a1, a2, a7, b1, b2, b4, b6, b7, c1, d2	<b>Drug absorption</b> <input type="checkbox"/> Definition, significance <input type="checkbox"/> Expression parameters (cumulative % absorbed, absorption rate, absorption rate constant) <input type="checkbox"/> Mechanisms and governing equations, properties and examples of drugs absorbed by each mechanism. Passive diffusion (transcellular) : Fick's law. o Carrier-mediated : Active transport, facilitated diffusion,	2	4



			o Convective (paracellular) transport, ion-pair transport, endocytosis		
		a1, a2, a7, b1, b2, b4, b6, b7, c1, d2	<b>metabolism (biotransformation)</b> Definition, significance of , Expression parameters: volume of distribution and related equations (related to blood flow, dose and plasma concentration, Mechanisms (passive diffusion, active transport), steps and sites of distribution □ Definition, significance of drug biotransformation, Outcomes (products: active, inactive metabolite) with examples of drugs □ Sites of metabolism: resystemic (first-pass effect), hepatic with examples of drugs highly influenced by presystemic metabolism. □ Mechanisms (phases Reaction): phase I and phase II: types of reactions, examples of drugs , Affecting factors : Biological Factors , pharmaceutical factors and Exogenous factors <b>drug excretion</b> □ Definition, significance □ Renal excretion : the nephron anatomy □ Properties of drugs excreted by the kidneys, Mechanisms: glomerular filtration, active tubular secretion, Tubular reabsorption, Factors affecting each excretion mechanism: biological, pharmaceutical and exogenous factors □ Excretion from the liver and other organs and the enterhepatic circulation	2	4
	mid-term exam			1	2
3	<b>Biological factors affecting drug bioavailability</b>	a1, a3, a7, b1, b2, c1, d2	<ul style="list-style-type: none"><li>biological factors affecting drug absorption" anatomy and physiology of absorption site of different routes of administration</li><li>biological factors affecting drug distribution" plasma protein binding, others</li></ul>	3	6



			<ul style="list-style-type: none"> <li>biological factors affecting drug metabolism "</li> <li>biological factors affecting drug excretion</li> <li>Pathological factors affecting bioavailability</li> <li>genetic factors affecting bioavailability</li> </ul>		
4	<b>Pharmaceutical factors affecting drug bioavailability</b>	a1, a3, a4, a7, b1, b2, c1, c2, d2	<ul style="list-style-type: none"> <li>factors affecting related to drug physicochemical properties</li> <li>factors related to excipients</li> <li>factors related to formulation (dosage forms)</li> <li>factors related to manufacturing method.</li> </ul>	2	4
5	<b>Biopharmaceutical studies</b>	a1, a2, a3, a6, a7, b1, b2, b3, b5, b6, b7, c1, c2, d2	<ul style="list-style-type: none"> <li>Biopharmaceutical classification scheme</li> <li>In vivo studies: Pharmacokinetic and pharmacodynamics Bioavailability study ( For a new drug): absolute bioavailability, definition, equation,</li> <li>Bioequivalence study : relative bioavailability, definition, equation</li> <li>□ In vitro studies : Drug release and dissolution studies (in fasted and feed state) in fluid simulant to that the g.i.t fluid, In vitro Stability of drug in fluid simulant to those of g.i.t, Permeability studies (partition coefficient determination, Ex vivo permeation studies</li> <li>□ IVIVC : in vivo in vitro correlation studies</li> </ul>	2	
<b>Course Review</b>		a1, a2, a3, a4, a5, a6, a7, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2	Review of the course topics by discussion session.	1	2



FINAL - EXAM	1	2
TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a summary of one of the studied topics.	c3, c4,	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report of three biopharmaceutical studies concerning one factor affecting in bioavailability.	c3, c4, d1, d3,	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, a6, a7, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2
2	Assignments (1 + 2)	4, 14	10	10	c3, c4, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, c1
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a7, b1, b2, b4, b6, b7, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, a6, a7, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Shargel. Biopharmaceutics and pharmacokinetics, 2002, McGraw Hill Inc.

### 2- Essential References.

1. Gibaldi. Biopharmaceutics and clinical pharmacokinetics
2. Harle. Pharmacokinetics and biopharmaceutics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.





## Course Plan (Syllabus) of

## BIOPHARMACEUTICS & PHARMACOKINETICS I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study the interrelationship of the physicochemical properties of the drug, the dosage form, the biological factors with the rate and extent of drug availability at the site of action and accordingly its therapeutic efficacy. The course also provides the students with essential knowledge of biopharmaceutical studies.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Provide clinically-based examples of drugs whose bioavailability were affected by various factors.
2.		a2. Explain the biological steps of drugs bioavailability and the laws/equations governing them.
3.		a3. Determine the physicochemical, biological and pharmaceutical factors that affect drug bioavailability.
4.		a4. Recognize the role of excipients and the type of dosage forms in drug bioavailability.
5.	A3	a5. Define biopharmaceutics, bioavailability and bioequivalence.
6.		a6. Explicit the biopharmaceutical classification system (BCS) of drugs.
7.	A4	a7. Comprehend his/her role as a pharmacist in assessment and improvement of drug bioavailability and hence drugs therapeutic efficacy.
8.	B1	b1. Express drug bioavailability using rate and extent expression.
9.		b2. Interpret figures and graphs of biopharmaceutical studies.
10.	B2	b3. Classify drugs biopharmaceutically.
11.		b4. Compare between various biological steps involved in drug bioavailability.
12.	B3	b5. Relate between in vitro and in vivo biopharmaceutical data.
13.	B4	b6. Assess drug bioavailability based on in vivo or in vitro data
14.		b7. Select the most appropriate approach to test the bioavailability and its various step.
15.	C2	c1. Apply biopharmaceutics knowledge to recommend patients /physicians of the best approaches of enhancing drug bioavailability.
16.		c2. Choose the best drug/formulation based on their bioavailability studies data.
17.	C4	c3. Search efficiently for information using documented and electronic sources of information.
18.		c4. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Work successfully in team-work.



20.	D2	d2. Show respect to life& behave in discipline during practicing practical and professional works and assignments.
21.	D3	d3. Communicate effectively with colleagues.
22.	D4	d4. Demonstrate the ability of time management and self-learning.

+

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, , a2, a3	Lecture, feed-back leaning	Written exam , Attendance, assignment
a5, a6	Lecture	Written exam , Attendance
a7	Lecture	Written exam , Attendance
(b) Alignment Course Intended Learning Outcomes (CILOs) ofIntellectual Skillsto Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam , Attendance, assignments
b3, b4, b5	Lecture	Written exam , Attendance
b6, b7	Lecture	Written exam , Attendance
(c)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2	Lecture, feed-back leaning	Written exam , Attendance , assignments, quizzes
c3, c4	feed-back learning, Group-project	Assignments
(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
	Feed-back learning	Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to biopharmaceutics</b>	a2, a3, a5, a7, b1, b2,c1, d2	<ul style="list-style-type: none"> <li>□ Definition and significance of biopharmaceutics and bioavailability.</li> <li>□ relation of biopharmaceutics to other pharmaceutical sciences</li> <li>□ correlation between bioavailability &amp; drug efficacy</li> <li>□ Expressions of drug bioavailability</li> <li>□ factors affecting bioavailability</li> <li>□ Introduction to steps for drug bioavailability</li> </ul>	1	2
2	<b>Bioavailability steps</b>	a1, a2, a7, b1, b2, b4, b6, b7, c1, d2	<b>Drug Release</b> Definition, significance , Expression parameters (cumulative % release, drug release rate) □ Mechanisms and governing equations : Fick`s law, Higuchi equation, Peppas equation (matrix diffusion, membrane diffusion, Fickian, Non-Fickian, controlled) <b>Drug dissolution</b> □ Definition, significance , Expression parameters (cumulative % dissolved, dissolution rate), Mechanisms and governing equations : Noyes-Whitney equation	1	2
		a1, a2, a7, b1, b2, b4, b6, b7, c1, d2	<b>Drug absorption</b> □ Definition, significance □ Expression parameters (cumulative % absorbed, absorption rate, absorption rate constant) □ Mechanisms and governing equations , properties and examples of drugs absorbed by each mechanism. Passive diffusion (transcellular) : Fick`s law. o Carrier-mediated : Active transport, facilitated diffusion, o Convective (paracellular) transport, ion-pair transport, endocytosis	2	4



		a1, a2, a7, b1, b2, b4, b6, b7, c1, d2	<p><b>metabolism (biotransformation)</b> Definition, significance of , Expression parameters: volume of distribution and related equations (related to blood flow, dose and plasma concentration, Mechanisms (passive diffusion, active transport), steps and sites of distribution □ Definition, significance of drug biotransformation, Outcomes (products: active, inactive metabolite) with examples of drugs □ Sites of metabolism: resystemic (first-pass effect), hepatic with examples of drugs highly influenced by presystemic metabolism. □ Mechanisms (phases Reaction): phase I and phase II: types of reactions, examples of drugs , Affecting factors : Biological Factors , pharmaceutical factors and Exogenous factors</p> <p><b>drug excretion</b> □ Definition, significance □ Renal excretion : the nephron anatomy □ Properties of drugs excreted by the kidneys, Mechanisms: glomerular filtration, active tubular secretion, Tubular reabsorption, Factors affecting each excretion mechanism: biological, pharmaceutical and exogenous factors □ Excretion from the liver and other organs and the enterhepatic circulation</p>	2	4
mid-term exam				1	2
3	<b>Biological factors affecting drug bioavailability</b>	a1, a3, a7, b1, b2, c1, d2	<ul style="list-style-type: none"> <li>biological factors affecting drug absorption" anatomy and physiology of absorption site of different routes of administration</li> <li>biological factors affecting drug distribution" plasma protein binding, others</li> <li>biological factors affecting drug metabolism "</li> <li>biological factors affecting drug</li> </ul>	3	6



			<p>excretion</p> <ul style="list-style-type: none"> <li>• Pathological factors affecting bioavailability</li> <li>• genetic factors affecting bioavailability</li> </ul>		
4	<b>Pharmaceutical factors affecting drug bioavailability</b>	a1, a3, a4, a7, b1, b2, c1, c2, d2	<ul style="list-style-type: none"> <li>• factors affecting related to drug physicochemical properties</li> <li>• factors related to excipients</li> <li>• factors related to formulation (dosage forms)</li> <li>• factors related to manufacturing method.</li> </ul>	2	4
5	<b>Biopharmaceutical studies</b>	a1, a2, a3, a6, a7, b1, b2, b3, b5, b6, b7, c1, c2, d2	<ul style="list-style-type: none"> <li>• Biopharmaceutical classification scheme</li> <li>• In vivo studies: Pharmacokinetic and pharmacodynamics Bioavailability study ( For a new drug): absolute bioavailability, definition, equation,</li> <li>• Bioequivalence study : relative bioavailability, definition, equation</li> <li>• □ In vitro studies : Drug release and dissolution studies (in fasted and feed state) in fluid simulant to that the g.i.t fluid, In vitro Stability of drug in fluid simulant to those of g.i.t, Permeability studies (partition coefficient determination, Ex vivo permeation studies</li> <li>• □ IVIVC : in vivo in vitro correlation studies</li> </ul>	2	
	<b>Course Review</b>	a1, a2, a3, a4, a5, a6, a7, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2



TOTAL	16	32
Number of Weeks /and Units Per Semester	16 weeks	Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a summary of one of the studied topics.	c3, c4,	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report of three biopharmaceutical studies concerning one factor affecting in bioavailability.	c3, c4, d1, d3,	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, a6, a7, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2
2	Assignments (1 + 2)	4, 14	10	10	c3, c4, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, c1
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a7, b1, b2, b4, b6, b7, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, a6, a7, b1, b2, b3, b4, b5, b6, b7, c1, c2, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Shargel. Biopharmaceutics and pharmacokinetics, 2002, McGraw Hill Inc.

### 2- Essential References.

1. Gibaldi. Biopharmaceutics and clinical pharmacokinetics
2. Harle. Pharmacokinetics and biopharmaceutics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)





## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### **BIOPHARMACY & PHARMACOKINETICS II**

I. Course Identification and General Information:							
1.	Course Title:	BIOPHARMACY &PHARMACOKINETICS II					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( FOURTH ) Year – ( SECOND ) semester					
5.	Pre –requisite (if any):	• Biopharmaceutics & PHARMACOKINETICS I					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of substantial mathematical kinetics of absorption, distribution, metabolism and excretion (ADME) of drugs..



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Discuss the basic mathematical principles of calculations of pharmacokinetic processes.
2.		a2. Identify the types of order of drug amount change in the body and the models of pharmacokinetic distribution
3.		a3. Recognize the step-wise procedures and techniques employed during pharmacokinetic studies and data analysis obtained after analysis of blood, urine or other samples.
4.	A4	a4. Comprehend his/her role as a pharmacist to calculate pharmacokinetic parameters of intravenous and extra vascular, administration of drugs, correctly and efficiently.
5.	B1	b1. Interpret the graphical parameters of drug concentration in the body versus time.
6.	B2	b2. Solve graphically & mathematical pharmacokinetics problems.
7.		b3. Determine the model at which drug distribute in the body and the orders at which the drug concentration in the body changes.
8.		b4. Calculate the drug concentration in the body at any given time.
9.		b5. Calculate the drug bioavailability mathematically.
10.		b6. calculate the dose required to attain a therapeutic concentration in the body.
11.		b7. Compare between pharmacokinetic parameter of absorption, distribution, excretion or metabolism of different drugs or formulations
12.	B4	b8. Assess the bioavailability of different drugs/ formulations in comparison to other drugs/ formulations..
13.	C1	c1. Operate and use scientific calculator correctly such as logarithm, natural logarithm, natural bases to determine pharmacokinetic parameters
14.	C2	c2. Apply equations and rules to solve of pharmacokinetics to obtain definite data of drug kinetics in the body.
15.	C4	c3. Present and report his work effectively and correctly.
16.	D1	d1. work successfully in team-work.
17.	D4	d2. Demonstrate the ability of time management, self-learning and



		problem solving.
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2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1 , a2, a3, a4	lecture-discussion , feed-back learning	Written exam , Attendance assignments
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4, b5, b6, b7, b8	lecture-discussion , feed-back learning	Written exam , Attendance assignments , quizzes
(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	lecture-discussion , feed-back learning	Written exam , Attendance assignments
c3	feed-back learning	assignments
(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Feed-back learning	Assignments
d2	Feed-back learning	Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b1, b2, c1	<ul style="list-style-type: none"> <li>definition and significance of pharmacokinetics , abbreviations and brief definitions of pharmacokinetic data . Definitions , significance, related equations of substantial pharmacokinetic data : half-life (<math>t_{1/2}</math>), clearance (Cl), volume of distribution, (Vd), Area under the curve (<math>AUC_{\infty}</math>)</li> <li>□ Mathematical fundamentals of pharmacokinetics: Common logarithm (log) , natural logarithm (ln), base exponent (<math>e^{-x}</math>), Demonstrating of X Y data : tabular form, graphical form (semilog paper, rectangular coordinate paper), Straight line : general equation, determination of slope and rate constant graphically on, semilog paper, rectangular coordinate paper <i>with Solved and homework problems.</i></li> </ul>	2	4
2	<b>Pharmacokinetic study</b>	a1, a2, a3, c1	<ul style="list-style-type: none"> <li>Dosing : drug administration. Sampling: blood, urine , others (advantages, disadvantage), interval of sampling, considerations of sampling. Analyzing of sample. Data from urine samples analysis : curves of cumulative amount of drug excreted (<math>\Sigma Du</math>) versus time, excretion rate (<math>\Sigma Du/dt</math>) versus time, amount of drug remaining</li> </ul>	1	2



			to be excreted ( $ARE = Du_{\infty} - \sum Du$ ) versus time. Data from blood samples analysis : drug concentration in plasma ( $C_p$ ) versus time curve after intravenous and extravascular administration		
3	Analysis of data	a1, a2, a3, b2, c1, c2, d5	<ul style="list-style-type: none"> <li>(i) Determination Area under the curve (<math>AUC_{\infty}</math>) mathematically by trapezoidal method with <b>Solved and homework exercises</b></li> <li>(ii) <b>Pharmacokinetic models of distribution:</b> definition, significance, types (one-compartment, two compartments, three compartment) and principle of each model, graphical figures illustrating each model after intravenous and extravascular administration, determination of pharmacokinetic model mathematically and graphically with <b>Solved and homework problems</b></li> <li>(iii) <b>The order of kinetic rate :</b> definition, significance and types (first order, zero order), Determination of the order of elimination rate from the last points : mathematically, graphically (semilog paper, rectangular paper) <b>with Solved and homework problems.</b> Determination of the distribution rate in two compartment model, from the points after the maximum <math>C_p</math> , graphically (semilog paper, rectangular paper) by extrapolation residual line</li> </ul>	2	4



			method <i>with Solved and homework problems</i>		
4 (I)	<b>Pharmacokinetics of drugs given by intravenous administration</b>	a1, b1, b2, b3, b4, b6, c1, c2, d5	<ul style="list-style-type: none"> <li>(graphical and tabular representation, general equations of drug concentration in plasma at a given time, determination of rates constant, volume of distribution, half-life, clearance and other pharmacokinetic data) <i>with Solved and homework problems</i> for</li> <li><b>1- I.V. single bolus</b> <ul style="list-style-type: none"> <li><b>Blood data</b> <ul style="list-style-type: none"> <li>□ One-compartment : first-order elimination, zero order elimination</li> <li>□ Two compartment: first-order elimination, zero order elimination</li> </ul> </li> <li><b>Urine data</b> <ul style="list-style-type: none"> <li>□ One-compartment : first-order elimination, zero order elimination, excretion rate versus time, ARE versus time</li> </ul> </li> </ul> </li> </ul>	2	4
MID-TERM EXAM				1	2
4 (II)	<b>Pharmacokinetics of drugs given by intravenous administration</b>		<b>2. I.V. multiple dosing :</b> One-compartment assuming first order elimination , specific data (C <sub>max</sub> , C <sub>min</sub> , C <sub>max∞</sub> , C <sub>min∞</sub> , C <sub>P∞</sub> , C <sub>SS</sub> , <ul style="list-style-type: none"> <li><b>3. I.V. infusion: one-compartment model:</b> specific data (rate of infusion(R), steady state concentration C<sub>ss</sub>, maintenance dose D<sub>m</sub>, loading dose DL) . General equations and how to determine specific data and substantial data (half-life (t<sub>1/2</sub>), clearance (Cl), volume of distribution, (V<sub>d</sub>))</li> </ul>	2	4



			When the rate of infusion is constant , the rate of infusion changes, when I.V. bolus		
5	Pharmacokinetics of drugs given by extravascular administration (oral, intramuscular, sublingual, buccal, rectal, etc)	a1, b1, b2, b3, b4, b6c1, c2, d5	<ul style="list-style-type: none"> <li>graphical and tabular representation of pharmacokinetic data</li> <li>(graphical and tabular representation, general equations of drug concentration in plasma at a given time, determination of rates constant, volume of distribution, half-life, clearance and other pharmacokinetic data)</li> </ul> <p><b>with Solved and homework problems for</b></p> <p><b>1. extravascular Single dosing</b></p> <ul style="list-style-type: none"> <li>(A) Blood data</li> <li>Definitions of Specific data of absorption phase: <math>K_a</math>, <math>F</math>, <math>C_{max}</math>, <math>T_{max}</math>, <math>D_{ab}</math>, <math>D_{ab\infty}</math>, <math>f_{ab}</math> (fraction absorbed) , <math>f_{ua}</math> (fraction unabsorbed),</li> <li>o Determination of elimination rate constant and half-life from the last points of elimination phase</li> <li>o determination of <math>K_a</math> by residual method from</li> <li><math>C_p</math> versus time curve.</li> <li>o determination of <math>C_{max}</math>, <math>T_{max}</math>, mathematically</li> <li>o determination of <math>D_{ab}</math>, <math>D_{ab\infty}</math>, <math>f_{ab}</math>, <math>f_{ua}</math></li> <li>o determination of <math>K_a</math> by Wagner – Nelson method from</li> <li><math>f_{ua}</math> versus time curve</li> <li>(B) Urine data</li> <li>□ One-compartment : first-order elimination, zero order elimination, ARE versus time</li> </ul> <p><b>2. extravascular multiple dosing :</b></p> <p>One-compartment assuming</p>	2	4





			firstorder elimination: One-compartment assuming first order elimination , specific data ( $C_{max}$ , $C_{min}$ , $C_{max\infty}$ , $C_{min\infty}$ , $CP_{\infty}$ , $CSS$ , )		
6	<b>Clinical Pharmacokinetics</b>	a1, b1, b2, b3, b4, b5, b6, b7, b8, c1, c2, d5	<ul style="list-style-type: none"> <li>(i) Loading and maintenance doses</li> <li>(ii) Doses and dosage interval at change from I.V. infusion to oral administration.</li> <li>(iii) Changes in plasma concentration with change in route of administration. Dose based on creatinine clearance</li> <li>(iv) Dose in the elderly</li> <li>(v) <b>Determination of absolute ad relative bioavailability</b> from blood and urine data</li> </ul>	2	4
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units



## V. Teaching strategies of the course:

**lecture - Discussion:** a short lecture/ address followed by discussion

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve mathematical problems during Tutorial at the class .	b2, b3, b4, b5, b6, b7, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to solve mathematical problems as homework.	b2, b3, b4, b5, b6, b7, d1	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2
2	Assignments (1 + 2)	4-13, 14	10	10	a1, b2, b4, c1, d1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3, b4, b5, b6, b7, d5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b3, b4, b6, c1, c2, d5
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2
TOTAL			100	100 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Shargel. Biopharmaceutics and pharmacokinetics, 2002, McGraw Hill Inc
2. Malcolm Rowland. Clinical pharmacokinetics: concepts and applications, 1996, Lippincott's Williams & Wilkins

### 2- Essential References.

1. Wagner. Pharmacokinetics for the pharmaceutical scientist
2. Venkaeswarlu. Biopharmaceutics and pharmacokinetics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



### IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### BIOPHARMACEUTICS & PHARMACOKINETICS II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of substantial mathematical kinetics of absorption, distribution, metabolism and excretion (ADME) of drugs..



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Align CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Discuss the basic mathematical principles of calculations of pharmacokinetic processes.
2.		a2. Identify the types of order of drug amount change in the body and the models of pharmacokinetic distribution
3.		a3. Recognize the step-wise procedures and techniques employed during pharmacokinetic studies and data analysis obtained after analysis of blood, urine or other samples.
4.	A4	a4. Comprehend his/her role as a pharmacist to calculate pharmacokinetic parameters of intravenous and extra vascular, administration of drugs, correctly and efficiently.
5.	B1	b1. Interpret the graphical parameters of drug concentration in the body versus time.
6.	B2	b2. Solve graphically & mathematical pharmacokinetics problems.
7.		b3. Determine the model at which drug distribute in the body and the orders at which the drug concentration in the body changes.
8.		b4. Calculate the drug concentration in the body at any given time.
9.		b5. Calculate the drug bioavailability mathematically.
10.		b6. calculate the dose required to attain a therapeutic concentration in the body.
11.		b7. Compare between pharmacokinetic parameter of absorption, distribution, excretion or metabolism of different drugs or formulations
12.	B4	b8. Assess the bioavailability of different drugs/ formulations in comparison to other drugs/ formulations..
13.	C1	c1. Operate and use scientific calculator correctly such as logarithm, natural logarithm, natural bases to determine pharmacokinetic parameters
14.	C2	c2. Apply equations and rules to solve of pharmacokinetics to obtain definite data of drug kinetics in the body.
15.	C4	c3. Present and report his work effectively and correctly.
16.	D1	d1. work successfully in team-work.
17.	D4	d2. Demonstrate the ability of time management, self-learning and problem solving.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1 , a2, a3, a4	lecture-discussion , feed-back learning	Written exam , Attendance assignments

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4, b5, b6, b7, b8	lecture-discussion , feed-back learning	Written exam , Attendance assignments , quizzes

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	lecture-discussion , feed-back learning	Written exam , Attendance assignments
c3	feed-back learning	assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Feed-back learning	Assignments
d2	Feed-back learning	Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b1, b2, c1	<ul style="list-style-type: none"> <li>definition and significance of pharmacokinetics , abbreviations and brief definitions of pharmacokinetic data . Definitions , significance, related equations of substantial pharmacokinetic data : half-life (<math>t_{1/2}</math>), clearance (Cl), volume of distribution, (<math>V_d</math>), Area under the curve (<math>AUC_{\infty}</math>)</li> <li>□ Mathematical fundamentals of pharmacokinetics: Common logarithm (log) , natural logarithm (ln), base exponent (<math>e^{-x}</math>), Demonstrating of X Y data : tabular form, graphical form (semilog paper, rectangular coordinate paper), Straight line : general equation, determination of slope and rate constant graphically on, semilog paper, rectangular coordinate paper <i>with Solved and homework problems.</i></li> </ul>	2	4
2	<b>Pharmacokinetic study</b>	a1, a2, a3, c1	<ul style="list-style-type: none"> <li>Dosing : drug administration. Sampling: blood, urine , others (advantages, disadvantage), interval of sampling, considerations of sampling. Analyzing of sample. Data from urine samples analysis : curves of cumulative amount of drug excreted (<math>\Sigma Du</math>) versus time, excretion rate (<math>\Sigma Du/dt</math>) versus time, amount of drug remaining to be excreted (<math>ARE = Du_{\infty} -</math></li> </ul>	1	2





			ΣDu) versus time. Data from blood samples analysis : drug concentration in plasma (Cp) versus time curve after intravenous and extravascular administration		
3	Analysis of data	a1, a2, a3, b2, c1, c2, d5	<ul style="list-style-type: none"> <li>(i) Determination Area under the curve (AUC<sub>∞</sub>) mathematically by trapezoidal method with <i>Solved and homework exercises</i></li> <li>(ii) <b>Pharmacokinetic models of distribution:</b> definition, significance, types (one-compartment, two compartments, three compartment) and principle of each model, graphical figures illustrating each model after intravenous and extravascular administration, determination of pharmacokinetic model mathematically and graphically with <i>Solved and homework problems</i></li> <li>(iii) <b>The order of kinetic rate :</b> definition, significance and types (first order, zero order), Determination of the order of elimination rate from the last points : mathematically, graphically (semilog paper, rectangular paper) <i>with Solved and homework problems.</i> Determination of the distribution rate in two compartment model, from the points after the maximum Cp , graphically (semilog paper, rectangular paper) by extrapolation residual line method <i>with Solved and</i></li> </ul>	2	4



			<i>homework problems</i>		
4 (I)	<b>Pharmacokinetics of drugs given by intravenous administration</b>	a1, b1, b2, b3, b4, b6, c1, c2, d5	<ul style="list-style-type: none"> <li>(graphical and tabular representation, general equations of drug concentration in plasma at a given time, determination of rates constant, volume of distribution, half-life, clearance and other pharmacokinetic data) <i>with Solved and homework problems</i> for</li> <li><b>1- I.V. single bolus</b> <ul style="list-style-type: none"> <li><b>Blood data</b> <ul style="list-style-type: none"> <li>□ One-compartment : first-order elimination, zero order elimination</li> <li>□ Two compartment: first-order elimination, zero order elimination</li> </ul> </li> <li><b>Urine data</b> <ul style="list-style-type: none"> <li>□ One-compartment : first-order elimination, zero order elimination, excretion rate versus time, ARE versus time</li> </ul> </li> </ul> </li> </ul>	2	4
MID-TERM EXAM				1	2
4 (II)	<b>Pharmacokinetics of drugs given by intravenous administration</b>		<p><b>2. I.V. multiple dosing :</b> One-compartment assuming first order elimination , specific data (<math>C_{max}</math>, <math>C_{min}</math>, <math>C_{max\infty}</math>, <math>C_{min\infty}</math>, <math>CP_{\infty}</math>, <math>CSS</math>,</p> <ul style="list-style-type: none"> <li><b>3. I.V. infusion: one-compartment model:</b> specific data (rate of infusion(<math>R</math>), steady state concentration <math>C_{ss}</math>, maintenance dose <math>D_m</math>, loading dose <math>DL</math>) . General equations and how to determine specific data and substantial data (half-life (<math>t_{1/2}</math>), clearance (<math>Cl</math>), volume of distribution, (<math>V_d</math>))</li> </ul>	2	4



			When the rate of infusion is constant , the rate of infusion changes, when I.V. bolus		
5	Pharmacokinetics of drugs given by extravascular administration (oral, intramuscular, sublingual, buccal, rectal, etc)	a1, b1, b2, b3, b4, b6c1, c2, d5	<ul style="list-style-type: none"> <li>graphical and tabular representation of pharmacokinetic data</li> <li>(graphical and tabular representation, general equations of drug concentration in plasma at a given time, determination of rates constant, volume of distribution, half-life, clearance and other pharmacokinetic data)</li> </ul> <p><b>with Solved and homework problems for</b></p> <p><b>1. extravascular Single dosing</b></p> <ul style="list-style-type: none"> <li><b>(A) Blood data</b></li> <li>Definitions of Specific data of absorption phase: <math>K_a</math>, <math>F</math>, <math>C_{max}</math>, <math>T_{max}</math>, <math>D_{ab}</math>, <math>D_{ab\infty}</math>, <math>f_{ab}</math> (fraction absorbed) , <math>f_{ua}</math> (fraction unabsorbed),</li> <li>o Determination of elimination rate constant and half-life from the last points of elimination phase</li> <li>o determination of <math>K_a</math> by residual method from</li> <li><math>C_p</math> versus time curve.</li> <li>o determination of <math>C_{max}</math>, <math>T_{max}</math>, mathematically</li> <li>o determination of <math>D_{ab}</math>, <math>D_{ab\infty}</math>, <math>f_{ab}</math>, <math>f_{ua}</math></li> <li>o determination of <math>K_a</math> by Wagner – Nelson method from</li> <li><math>f_{ua}</math> versus time curve</li> <li><b>(B) Urine data</b></li> <li>□ One-compartment : first-order elimination, zero order elimination, ARE versus time</li> </ul> <p><b>2. extravascular multiple dosing :</b></p> <p>One-compartment assuming</p>	2	4



			firstorder elimination: One-compartment assuming first order elimination , specific data ( $C_{max}$ , $C_{min}$ , $C_{max\infty}$ , $C_{min\infty}$ , $CP_{\infty}$ , $CSS$ , )		
6	<b>Clinical Pharmacokinetics</b>	a1, b1, b2, b3, b4, b5, b6, b7, b8, c1, c2, d5	<ul style="list-style-type: none"> <li>(i) Loading and maintenance doses</li> <li>(ii) Doses and dosage interval at change from I.V. infusion to oral administration.</li> <li>(iii) Changes in plasma concentration with change in route of administration. Dose based on creatinine clearance</li> <li>(iv) Dose in the elderly</li> <li>(v) <b>Determination of absolute ad relative bioavailability</b> from blood and urine data</li> </ul>	2	4
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units



## V. Teaching strategies of the course:

**lecture - Discussion:** a short lecture/ address followed by discussion

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve mathematical problems during Tutorial at the class .	b2, b3, b4, b5, b6, b7, d5	4-13	6
2	<b>Group :</b> each group of students will be assigned to solve mathematical problems as homework.	b2, b3, b4, b5, b6, b7, d1	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2
2	Assignments (1 + 2)	4-13, 14	10	10	a1, b2, b4, c1, d1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3, b4, b5, b6, b7, d5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b3, b4, b6, c1, c2, d5
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2
TOTAL			100	100 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Shargel. Biopharmaceutics and pharmacokinetics, 2002, McGraw Hill Inc
2. Malcolm Rowland. Clinical pharmacokinetics: concepts and applications, 1996, Lippincott's Williams & Wilkins

### 2- Essential References.

1. Wagner. Pharmacokinetics for the pharmaceutical scientist
2. Venkaeswarlu. Biopharmaceutics and pharmacokinetics

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



### IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
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5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### CLINICAL PHARMACY I

I. Course Identification and General Information:							
1.	Course Title:	CLINICAL PHARMACY I					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	2	-		-
4.	Study level/ semester at which this course is offered:	( FOURTH ) Year – ( 2ND ) semester					
5.	Pre –requisite (if any):	• Pharmacology I , II, III & IV					
6.	Co –requisite (if any):	• Hospital pharmacy					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course is designed to provide the students with essential knowledge and skills necessary to practice clinical pharmaceutical patient-oriented services in health-care facilities.





### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	<b>A3</b>	<b>a1.</b> Identify knowledge and skills required to practice clinical pharmacy in health care facilities.
2.		<b>a2.</b> Explicit the pharmaceutical care services offered by clinical pharmacists to patients in health care facilities.
3.		<b>a3.</b> Determine the non-pharmacotherapy and advices that assist in management of diseases.
4.	<b>A4</b>	<b>a4.</b> Comprehend his/her role as a pharmacist in offering clinical pharmaceutical care services to patients in health care facilities and in participation and communication with other members of the health care team.
5.	<b>B1</b>	<b>b1.</b> Express investigational data using abbreviations.
6.		<b>b2.</b> Interpret clinical features, lab. and instrumental investigations data used in diagnosis of diseases and data of patient medical records.
7.	<b>B2</b>	<b>b3.</b> Relate between investigational data and drug therapy required or applied.
8.	<b>C2</b>	<b>c1.</b> Educate patients about optimal drug use and advice how to limit risk factors
9.	<b>C4</b>	<b>c2.</b> Search efficiently for information using documented and electronic sources of information.
10.		<b>c3.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
11.	<b>D1</b>	<b>d1.</b> Work successfully in team-activities.
12.	<b>D2</b>	<b>d2.</b> Show respect to life and demonstrate the ability to serve community and to practice contemporary pharmacy in accordance with professional, legal and ethical standards.
13.	<b>D3</b>	<b>d3.</b> Communicate effectively and cooperate with colleagues, members of health care team, patients and other people.
14.	<b>D4</b>	<b>d4.</b> Demonstrate the ability of time management, self-learning and problem-solving skill



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam , Attendance, assignment, quizzes
b3	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture	Written exam , Attendance
c2	feed-back learning, Group-project	Assignments
c3	Feed-back learning	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to clinical pharmacy</b>	a1, a2, a4, d2	<ul style="list-style-type: none"> <li>Definition</li> <li>Patients-oriented services: clinical, hospital, community pharmacy; inter-relations and differences</li> <li>Pharmacy from dispensing service to caregiving</li> <li>Duties of clinical pharmacist</li> <li>Clinical pharmacists as drug information center: source of information, types of drug information demanded (indications, contraindications, precautions, drug interactions, etc.)</li> <li>basic requirements (knowledge and skills) of clinical pharmacist</li> </ul>	2	4
2	<b>Clinical pharmacist as a member of the health care team</b>	a1, a4, d2, d1, d3, d4	<ul style="list-style-type: none"> <li>sharing in morning rotation and discussion , cooperation with other members</li> <li>patient`s medical record (PMR): components, examples</li> <li>Skills of communication with patients</li> </ul>	2	2
	<b>Drugs therapy in specialized population</b>	a4	<ol style="list-style-type: none"> <li><b>Pregnant women:</b> Harmful effects on the fetus, Recognition of teratogenic drugs, pharmacokinetics in pregnancy, drugs prescribed in pregnancy (Pregnancy A, B, C, X categories), drugs prescribed for [pain, GIT disorders, diabetes, gestational diabetes, asthma, cough, allergy, urinary tract infection, hypertension, thyroid abnormalities, thromboembolism, inflectional vaginosis, Epilepsy, mental health disorders]</li> <li><b>lactating women:</b> factors influence the amount of drug an infant will receive through breast-feeding, drugs avoided during lactation, treatment</li> </ol>	2	



			of mastitis, postpartum depression, cessation of lactation)		
Mid-term exam				1	2
3	<b>Drugs therapy in specialized population</b>	a4	<p>3. <b>Pediatrics:</b> classification of pediatrics (newborn, infant, child), differences of pharmacodynamics and pharmacokinetics and admission sites of drugs in children, drug efficacy and toxicity, factors affecting pediatric therapy, drugs prescribed for [ pain, fever, infections, GIT disorders]</p> <p>4. <b>Geriatrics:</b> relation of aging to diseases, common physiological changes in aging, alteration of pharmacokinetics and pharmacodynamics of drugs, drugs risks in elderly, drugs avoided in geriatric patients.</p>	2	4
4	<b>Non-pharmacotherapy methods</b>	a1, a2, a3, a4, c1	<ul style="list-style-type: none"> <li>• Definition, types</li> <li>• Physiotherapy : role, advantages</li> <li>• Psychotherapy : role, advantages</li> <li>• Life-style changes</li> <li>• Diet control</li> </ul>	1	2



	<b>Clinical skills of diagnosis and data interpretation</b>	a1, a4, b1, b2, b3, b5, d4	<ul style="list-style-type: none"> <li>Clinical features</li> <li>Physical (clinical) examinations: methods and interpretation</li> <li>Vital signs evaluation and interpretation</li> <li>Clinical lab. Data interpretation: blood analysis (CBC, serology, biochemistry, tumor markers), stool analysis, urine analysis.</li> <li>Clinical instrumental diagnosis: techniques and data interpretation: Radiography, ultrasonography, Computed Tomography Scan (CT scan), Magnetic Resonance Imaging, Echocardiography, electrocardiogram (ECG), Endoscopy</li> </ul>	4	8
	<b>Course Review</b>	a1, a2, a4, b1, b2, b3, , d2, d1, d3, d4, ,	Review of the course topics by discussion session.	1	2
	<b>FINAL - EXAM</b>			1	2
	<b>TOTAL</b>			16	32
	<b>Number of Weeks /and Units Per Semester</b>			16 weeks	7 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve MCQs provided by the teacher . The questions should focus on interpretation of investigational data.	b1, b2, c2, c3,	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report on clinical investigations, lab. Data interpretation of specific group of patients e.g. <ul style="list-style-type: none"> <li>AIDS patients</li> <li>Patients in Intensive care unit ICU</li> <li>Diabetic foot patients</li> <li>Hemorrhoid patients</li> </ul>	b1, b2, c2, c3, d1, d3,	14	4

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b3, , d2, d1, d3, d4, ,
2	Assignments (1 + 2)	4, 14	10	10	b1, b2, , , c2, c3, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b3, , d2, d1, d3, d4, ,
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b3, , d2, d1, d3, d4
TOTAL			100	100 %	100



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Karen J. Tietze. Clinical skills for pharmacists : A Patient-Focused Approach, 2012, Elsevier Inc.
2. James M. Ritter , A text book of clinical pharmacology and therapeutics, 2008, HodderArn

### 2- Essential References.

1. Joseph T. Diprio, Encyclopaedia of clinical pharmacy, 2003, Marcel Dekker.
2. Widmann. Good clinical interpretation of laboratory tests

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
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5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of CLINICAL PHARMACY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course is designed to provide the students with essential knowledge and skills necessary to practice clinical pharmaceutical patient-oriented services in health-care facilities.





<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>1. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>A3</b>	<b>a1.</b> Identify knowledge and skills required to practice clinical pharmacy in health care facilities.
2.		<b>a2.</b> Explicit the pharmaceutical care services offered by clinical pharmacists to patients in health care facilities.
3.		<b>a3.</b> Determine the non-pharmacotherapy and advices that assist in management of diseases.
4.	<b>A4</b>	<b>a4.</b> Comprehend his/her role as a pharmacist in offering clinical pharmaceutical care services to patients in health care facilities and in participation and communication with other members of the health care team.
5.	<b>B1</b>	<b>b1.</b> Express investigational data using abbreviations.
6.		<b>b2.</b> Interpret clinical features, lab. and instrumental investigations data used in diagnosis of diseases and data of patient medical records.
7.	<b>B2</b>	<b>b3.</b> Relate between investigational data and drug therapy required or applied.
8.	<b>C2</b>	<b>c1.</b> Educate patients about optimal drug use and advice how to limit risk factors
9.	<b>C4</b>	<b>c2.</b> Search efficiently for information using documented and electronic sources of information.
10.		<b>c3.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
11.	<b>D1</b>	<b>d1.</b> Work successfully in team-activities.
12.	<b>D2</b>	<b>d2.</b> Show respect to life and demonstrate the ability to serve community and to practice contemporary pharmacy in accordance with professional, legal and ethical standards.
13.	<b>D3</b>	<b>d3.</b> Communicate effectively and cooperate with colleagues, members of health care team, patients and other people.
14.	<b>D4</b>	<b>d4.</b> Demonstrate the ability of time management, self-learning and problem-solving skill



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3, a4	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam , Attendance, assignment, quizzes
b3	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture	Written exam , Attendance
c2	feed-back learning, Group-project	Assignments
c3	Feed-back learning	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to clinical pharmacy</b>	a1, a2, a4, d2	<ul style="list-style-type: none"> <li>• Definition</li> <li>• Patients-oriented services: clinical, hospital, community pharmacy; inter-relations and differences</li> <li>• Pharmacy from dispensing service to caregiving</li> <li>• Duties of clinical pharmacist</li> <li>• Clinical pharmacists as drug information center: source of information, types of drug information demanded (indications, contraindications, precautions, drug interactions, etc.)</li> <li>• basic requirements (knowledge and skills) of clinical pharmacist</li> </ul>	2	4
2	<b>Clinical pharmacist as a member of the health care team</b>	a1, a4, d2, d1, d3, d4	<ul style="list-style-type: none"> <li>○ sharing in morning rotation and discussion , cooperation with other members</li> <li>○ patient`s medical record (PMR): components, examples</li> <li>○ Skills of communication with patients</li> </ul>	2	2
	<b>Drugs therapy in specialized population</b>	a4	<p>2. <b>Pregnant women:</b> Harmful effects on the fetus, Recognition of teratogenic drugs, pharmacokinetics in pregnancy, drugs prescribed in pregnancy (Pregnancy A, B, C, X categories), drugs prescribed for [pain, GIT disorders, diabetes, gestational diabetes, asthma, cough, allergy, urinary tract infection, hypertension, thyroid abnormalities, thromboembolism, inflectional vaginosis, Epilepsy, mental health disorders]</p> <p>5. <b>lactating women:</b> factors influence the amount of drug an infant will receive through breast-feeding, drugs</p>	2	



			avoided during lactation, treatment of mastitis, postpartum depression, cessation of lactation)		
Mid-term exam				1	2
3	<b>Drugs therapy in specialized population</b>	a4	<p>6. <b>Pediatrics:</b> classification of pediatrics (newborn, infant, child), differences of pharmacodynamics and pharmacokinetics and admiration sites of drugs in children, drug efficacy and toxicity, factors affecting pediatric therapy, drugs prescribed for [ pain, fever, infections, GIT disorders]</p> <p>7. <b>Geriatrics:</b> relation of aging to diseases, common physiological changes in aging, alteration of pharmacokinetics and pharmacodynamics of drugs, drugs risks in elderly, drugs avoided in geriatric patients.</p>	2	4
4	<b>Non-pharmacotherapy methods</b>	a1, a2, a3, a4, c1	<ul style="list-style-type: none"> <li>• Definition, types</li> <li>• Physiotherapy : role, advantages</li> <li>• Psychotherapy : role, advantages</li> <li>• Life-style changes</li> <li>• Diet control</li> </ul>	1	2



	<b>Clinical skills of diagnosis and data interpretation</b>	a1, a4, b1, b2, b3, b5, d4	<ul style="list-style-type: none"> <li>Clinical features</li> <li>Physical (clinical) examinations: methods and interpretation</li> <li>Vital signs evaluation and interpretation</li> <li>Clinical lab. Data interpretation: blood analysis (CBC, serology, biochemistry, tumor markers), stool analysis, urine analysis.</li> <li>Clinical instrumental diagnosis: techniques and data interpretation: Radiography, ultrasonography, Computed Tomography Scan (CT scan), Magnetic Resonance Imaging, Echocardiography, electrocardiogram (ECG), Endoscopy</li> </ul>	4	8
	<b>Course Review</b>	a1, a2, a4, b1, b2, b3, , d2, d1, d3, d4, ,	Review of the course topics by discussion session.	1	2
	<b>FINAL - EXAM</b>			1	2
	<b>TOTAL</b>			16	32
	<b>Number of Weeks /and Units Per Semester</b>			16 weeks	7 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



VI. Assignments:				
No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve MCQs provided by the teacher . The questions should focus on interpretation of investigational data.	b1, b2, c2, c3,	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report on clinical investigations, lab. Data interpretation of specific group of patients e.g. <ul style="list-style-type: none"> <li>AIDS patients</li> <li>Patients in Intensive care unit ICU</li> <li>Diabetic foot patients</li> <li>Hemorrhoid patients</li> </ul>	b1, b2, c2, c3, d1, d3,	14	4

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, b1, b2, b3, , d2, d1, d3, d4, ,
2	Assignments (1 + 2)	4, 14	10	10	b1, b2, , , c2, c3, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, b1, b2, b3, , d2, d1, d3, d4, ,
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, b1, b2, b3, , d2, d1, d3, d4
TOTAL			100	100 %	100



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Karen J. Tietze. Clinical skills for pharmacists : A Patient-Focused Approach, 2012, Elsevier Inc.
2. James M. Ritter , A text book of clinical pharmacology and therapeutics, 2008, HodderArn

### 2- Essential References.

1. Joseph T. Diprio, Encyclopaedia of clinical pharmacy, 2003, Marcel Dekker.
2. Widmann. Good clinical interpretation of laboratory tests

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course specification of: Clinical Biochemistry

1.	Course Title :					Clinical Biochemistry
2.	Course Code and Number:					
3.	Lecture	Training	Practical	Seminar/ Tutorial	Total	Credit Hours: 2
	2	-	-	-	2	
4.	Study Level and Semester:					Fourth Year –FIRST Semester
5.	Pre-requisites (if any):					Biochemistry I,II
6.	None Co-requisites (if any):					None
7.	Program in which the course is offered:					PHARMCY
8.	Teaching Language:					English
9.	Study System:					Obligatory attendance
10.	Prepared by					
11.	Location of teaching the course:					Yemen University
12.	Date of Approval :					2015
13.	Approved by:					

### I. Course Description :

This course provides the students with knowledge on the biochemical parameters for renal, liver, cardiac, bone, prostatic, and pancreatic pathology. It also provides student with the skills required for laboratory detection of these parameters. In addition , the course provides fundamental knowledge about tumor markers.

### II. Course Aims :

Upon completion this course the student will be able to :

1. Know most of the skills required for practitioners in all areas of the clinical laboratory.
2. Describe the pathological mechanisms resulting in different organ systems of the body, and the markers used for their laboratory diagnosis.
3. Understand the problems, problem solving and avoiding errors in clinical chemistry performance
4. Correlate between signs and symptoms of some diseases with the presence of certain abnormalities of biochemical molecule defects.



Alignment CILOs to PILOs		
PILOs	ILCOs	٢
A1	a1. Identify the diseases, and disorders related to each organs of the human body.	a1
A2	a2. Discuss the causes, and laboratory markers of the defects in each organs of the human body.	a2
	a3. Explain the pathophysiological role of endogenous and exogenous substances participating in the defect of the human body organs.	a3
	a4. Clarify the relation between organic disorders in the human body.	a4
	a5. Classify the organ-related disorders based on the prevalence, importance, and laboratory diagnosis.	a5
B1	b1. Interpret the laboratory findings of any clinical chemistry- related tests appropriately	b1
B2	b2. Compare the clinical observations of disorders found in liver, kidney, heart, pancreas, and bone with the laboratory findings.	b2
	b3. Relate / correlate the organ defect – causing factors to the resulted disorders.	b3
C1	c1. Perform efficiently the clinical biochemistry –related tests by implementing the Standard Operating Procedures (SOPs).	c1
C2	c2. Operate successfully the instruments used in clinical biochemistry lab either manually or by using automated systems.	c2
	c3. Use the principles of instrument working procedures (manual-based tools) to operate the advanced or automated instruments.	c3
D1	d1. Work successfully in team-work.	d1
D2	d2. Show respect for life and commitment to his/her colleagues.	d2
D3	d3. Communicate effectively with his /her colleagues and studying environment.	d3
D4	d4. Compliance with health laws, ethics, conduct and discipline while practicing the work of his/her major.	d4

1- Intended Learning Outcomes of Course ( ILCOs) :	
Knowledge and Understanding:	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Knowledge and Understanding CILOs	Knowledge and Understanding PILOs

After completing this course, students would be able to:	After completing this program, students would be able to:	
a1. Identify the diseases, and disorders related to each organs of the human body.	Understand the current tasks and duties of laboratory professionals as professionals and the sciences relevant to medical laboratories and the historical progress of the profession.	A1
a2. Discuss the causes, and laboratory markers of the defects in each organs of the human body.	Explanation of the structures, biological stages and functions of the different parts of living organisms, including the human body, as well as knowledge of the sources, causes and mechanisms of diseases that afflict humans.	A2
a3. Explain the pathophysiological role of endogenous and exogenous substances participating in the defect of the human body organs.		
a4. Clarify the relation between organic disorders in the human body.		
a5. Classify the organ-related disorders based on the prevalence, importance, and laboratory diagnosis.		

Intellectual Skills:		
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)		
Intellectual Skills CILOs	Intellectual Skills PILOs	
After completing this course, students would be able to:	After completing this program, students would be able to:	
b1. Interpret the laboratory findings of any clinical chemistry- related tests appropriately.	Analyzing different mental processes such as interpretations, descriptions, statistical approaches, conclusions and others in dealing with various phenomena or problems related to medical laboratory work.	B1
b2. Compare the clinical observations of disorders found in liver, kidney, heart, pancreas, and bone with the laboratory findings.	Comparing, differentiating and distinguishing between the components, phenomena and related concepts and classifying the different components based on certain characteristics.	B2
b3. Relate / correlate the organ defect – causing factors to the resulted disorders.		

Professional and Practical Skills:	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Professional and Practical Skills CILOs	Professional and Practical Skills PILOs

After completing this course, students would be able to:	After completing this program, students would be able to:	
c1. Perform efficiently the clinical biochemistry – related tests by implementing the Standard Operating Procedures (SOPs).	Implementation of Standard Operating Procedures (SOPs) and safety standards while conducting medical laboratory work in laboratories and hospitals.	C1
c2. Operate successfully the instruments used in clinical biochemistry lab either manually or by using automated systems.	Dealing with and operating the various tools and equipment used in the work of medical laboratories, whether in hospitals, quality departments, clinical medical laboratories or research and development centers.	C2
c3. Use the principles of instrument working procedures (manual-based tools) to operate the advanced or automated instruments.		

#### Transferable (General) Skills :

#### Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Transferable (General) Skills CILOs	Transferable (General) Skills PILOs	
After completing this course, students would be able to:	After completing this program, students would be able to:	
d1. Work successfully in team-work.	Successfully participate in teamwork and reporting activities.	D1
d2. Show respect for life and commitment to his/her colleagues.	Show respect for life and commitment to community service.	D2
d3. Communicate effectively with his /her colleagues and studying environment.	Communicate effectively with colleagues, health care team members, patients, and other people.	D3
d4. Compliance with health laws, ethics, conduct and discipline while practicing the work of his/her major.	Compliance with health laws, ethics, conduct and discipline while practicing the work of medical laboratories.	D4

#### 2- Alignment of CILOs to Teaching and Assessment Strategies

##### First: Alignment of Knowledge and Understanding with the CILOs

Assessment Strategies	Teaching Strategies	Knowledge and Understanding ILCOs
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<ul style="list-style-type: none"> <li>• Assignments,</li> <li>• Class room participation</li> <li>• Quizzes</li> <li>• Homework,</li> <li>• Mid-term exam.</li> <li>• Final Exam.</li> <li>• Graduation project</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Seminars</li> <li>• Brainstorming,</li> <li>• Group Discussion</li> </ul>	<p>a1. Identify the diseases, and disorders related to each organs of the human body.</p> <p>a2. Discuss the causes, and laboratory markers of the defects in each organs of the human body.</p> <p>a3. Explain the pathophysiological role of endogenous and exogenous substances participating in the defect of the human body organs .</p> <p>a4. Clarify the relation between organic disorders in the human body.</p> <p>a5. Classify the organ-related disorders based on the prevalence, importance, and laboratory diagnosis.</p>
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## Second: Alignment of Intellectual Skills with the CILOs

Assessment Strategies	Teaching Strategies	Intellectual Skills CILOs
<ul style="list-style-type: none"> <li>• Assignments,</li> <li>• Class room participation</li> <li>• Quizzes</li> <li>• Homework,</li> <li>• Mid-term exam.</li> <li>• Final Exam.</li> <li>• Graduation project</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures,</li> <li>• Seminars</li> <li>• Brainstorming,</li> <li>• Group discussion</li> </ul>	<p>b1. Interpret the laboratory findings of any clinical chemistry- related tests appropriately .</p> <p>b2. Compare the clinical observations of disorders found in liver, kidney, heart, pancreas, and bone with the laboratory findings.</p> <p>b3. Relate / correlate the organ defect – causing factors to the resulted disorders.</p>

## Third: Alignment of Professional and Practical Skills with the CILOs

Assessment Strategies	Teaching Strategies	Professional and Practical Skills CILOs
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<ul style="list-style-type: none"> <li>• Assignments,</li> <li>• Class room participation</li> <li>• Quizzes</li> <li>• Homework,</li> <li>• Mid-term exam.</li> <li>• Final Exam.</li> <li>• Graduation project</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures .</li> <li>• Seminars</li> <li>• Brainstorming,</li> <li>• Group discussion</li> </ul>	<p>c1. Perform efficiently the clinical biochemistry –related tests by implementing the Standard Operating Procedures (SOPs ).(</p> <p>c2. Operate successfully the instruments used in clinical biochemistry lab either manually or by using automated systems.</p> <p>c3. Use the principles of instrument working procedures (manual-based tools) to operate the advanced or automated instruments.</p>
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Fourth: Alignment of Transferable (General) Skills with the CILOs		
Assessment Strategies	Teaching Strategies	Transferable (General) Skills CILOs
<ul style="list-style-type: none"> <li>• Assignments,</li> <li>• Class room participation</li> <li>• Quizzes</li> <li>• Homework,</li> <li>• Mid-term exam.</li> <li>• Final Exam.</li> <li>• Graduation project</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures .</li> <li>• Seminars</li> <li>• Brainstorming,</li> <li>• Group discussion</li> </ul>	<p>d1. Work successfully in team-work.</p> <p>d2. Show respect for life and commitment to his/her colleagues.</p> <p>d3. Communicate effectively with his /her colleagues and studying environment.</p> <p>d4. Compliance with health laws, ethics, conduct and discipline while practicing the work of his/her major.</p>

No.	Course Topics/Units ( Theoretical part)	Sub-topics	No. of Weeks	Co nt act ho ur s	CILOs
1	Liver diseases	-Introduction and function of liver -Common liver diseases and laboratory findings: Acute and chronic hepatitis: Hepatic viruses (HAV, HBV, HCV), autoimmune & toxins (alcoholic) Liver cirrhosis, hepatocellular carcinoma, and fatty liver, definition and causes <b><u>Jaundice (hyperbilirubinemia):</u></b> Types, etiological & classification of jaundice Prehepatic ( <b>hemolytic</b> ), hepatic and posthepatic ( <b>obstruction</b> ) jaundice Physiological jaundice (neonatal bilirubin), Gilbert and Kliglar Najjar syndromes	3	6	a1, c1, d2, d3
2	Renal diseases	-Renal Physiology. -Clinical Chemistry of Renal Diseases. Pre, renal, and post renal causes and diseases -Acute and chronic renal diseases -Nephrotic syndrome	3	6	a2, b1, b2, b3, c2, c3, d2,d3
3	Heart diseases	-Myocardial infarction, angina- heart failure description and causes	3	6	a3, b1, b2,b3, c1, c2,c3, d2, d3
Midterm exam			1	2	
4	Pancreatic diseases	Function of pancreas and pancreatic diseases (acute and chronic pancreatitis)	1	2	a4, b1, b2, b3, c1, c2, c3, d2, d3
5	Prostatic diseases	Function of prostate and prostatic diseases (prostatitis, and prostatic tumor)	1	2	a5, b1, b2, b3, c1, c3, d2, d3
6	Bone diseases	Osteomalacia, rektisia causes, relation to the lab. Findings	1	2	a1, b1, b2, b3, c1, c2, c3, d2, d3
7	Tumor Markers (TM)	Definition and nature of tumor markers Classification of TM Clinical application, useful and laboratory measurements of TM according to organ specificity cancers CEA, AFP, PSA, CA125, CA15-3, CA 19-9 description and clinical applications	1	2	a1, b1, b2, b3, c1, c2, c3, d2, d3

	<b>Revision</b>		1	2	
	<b>Final exam</b>		1	2	
	<b>Total number of weeks and hours</b>		16	32	

No.	Course Topics/Units (Practical part)	Tasks/Experiments	No. of Weeks	Co nt act ho ur s	CILOs
1	Liver diseases	Liver function tests: Bilirubin, GPT, GOT, ALP, ALB, GGT	5	10	a1, c1, d2, d3
2	Renal diseases	Renal function tests: Creatinine, Creatinine clearance, urea	3	6	a2, b1, b2, b3, c2, c3, d2,d3
3	Heart diseases	CK-MB, Troponin, lipid profile (Total cholesterol, T.G, LDL, HDL)	3	6	a3, b1, b2,b3, c1, c2,c3, d2, d3
4	Pancreatic diseases	Oral glucose tolerance test Amylase, Lipase	1	2	a4, b1, b2, b3, c1, c2, c3, d2, d3
5	Prostatic diseases	Acid phosphatase. PSA	1	2	a5, b1, b2, b3, c1, c3, d2, d3
6	Bone diseases	Ca <sup>2+</sup> , ALP, Phosphorus	1	2	a1, b1, b2, b3, c1, c2, c3, d2, d3
7	Tumor Markers (TM)	Acid phosphatase, LDH, ALP	1	2	a1, b1, b2, b3, c1, c2, c3, d2, d3
Final exam			1	2	
Total number of weeks and hours			16	32	



## I. Teaching Strategies

- **Lecture:** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom  
The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming:** It depends on stimulation of the student's brain through a group of questions &/or **Concepts map:** which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- **Feed-back learning:** students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation.
- **Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills.

## II. Tasks and Assignments :

No.	Task/Assignment	CILOs	Week due	Mark
1	<b>Group assignment:</b> each group of students will be assigned to do a summary report on one of the clinical biochemistry II topics.	a1,a2,a3, a4,a5, , c1, c3, d1	14	10

## III. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course (CILOs)
1	Attendance	1 - 15	5	5 %	a1, a2, a3, a4,a5, , b2, b3, c3, d1
2	Assignments (1 + 2)	4, 14	10	10 %	a3, a4, c1, d1
3	Quiz 1 + Quiz 2	7, 12	5	5 %	b1, b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20 %	a1, a2, a3, a4,a5, b2, b3, c3, d1
5	Final exam of theoretical part ( written exam)	17	60	60 %	a1, a2, a3, a4,a5, b2, b3, c3, d1
TOTAL			100	100 %	

Essential References-not less than 4

1. Richard Ravel: Clinical Laboratory Medicine: Clinical Applications of Laboratory Data; 6th edition; Mosby 1995
2. Frances T Fischbach RN: A Manual of Laboratory and Diagnostic Tests; 7th edition; Lippincott Williams & Wilkins Publishers; 2003
3. Chinde Rana, Chatterjea. Text book of medical biochemistry, 6th edition, JAYPEE brothers. New Delhi 2005.
4. Cohen (2009). Memmler's Structure & Function of Human Body, LWW

V.	IV. Course Policies:
1	<b>Class Attendance:</b> Student should attend at least 75% of the total contact hours of the subject; otherwise he/she will not be allowed to sit for the course exam and will be considered as exam failure. If the student's absence repeated due to illness, he/she will be demanded to provide a definite proof from the university Clinic. If the student's absence rate is above 25% of the course total contact hours without a reasonable excuse, he/she will be notified to study the entire course again.
2	<b>Tardiness:</b> Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course according the university regulations.
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules
7	<b>Other policies:</b> <ul style="list-style-type: none"> <li>- The mobile is not allowed to be used during the lecture. It must be turned off, otherwise the student will be asked to leave the lecture room.</li> <li>- The mobile is not allowed to be taken to the exam hall.</li> <li>- Lecture notes and assignments may be given directly to students using soft or hard copy.</li> <li>- Students should familiarize themselves with all University and College Policies that cover students' rights, responsibilities and the Academic Appeal process.</li> </ul>



## Course Specification

### field training I

I. Course Identification and General Information:							
1.	Course Title:	field training I					
2.	Course Code &Number:	YMP					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		-	-	-			2
4.	Study level/ semester at which this course is offered:	Fourth year/2 <sup>nd</sup> -semester					
5.	Pre –requisite (if any):	All courses of the first four years					
6.	Co –requisite (if any):	Nil					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	The Community and Hospital Pharmacies					
10	Prepared By:	Prof. Dr. Ali Gamal Al-kaf Reviewed by prof. Dr. Jalal Hamoud Al-qadasi					
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

## **II. Course Description:**

This course offers all the knowledge and experience to pharmacy students who want to work in community or hospital pharmacies as their future job.



## I. Intended learning outcomes (ILOs) of the course:

**At the end of this course, the students will be able to:**

1. Familiar with the requirements and conditions of the storage for pharmaceuticals in the pharmacy and the process of ordering, receiving, pricing and returning medication products from wholesalers.
2. Know factors that should drive the development of value-added pharmacy services
3. Correlate pharmaceutical, biomedical and clinical knowledge to patient care.
4. Properly, interpret the pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.
5. Retrieve drug information on key assigned concepts (brand/generic name, use, usual dosage form(s), route of administration, common adverse drug reactions, and major patient counseling points).
6. Select appropriate management strategy for patients in different medical situations.
7. Review a patient's medication profile to detect medication allergies, correct doses, duplicate medications, and important drug interactions.
8. Provide level-appropriate counseling to patients, physician and/or other caregivers including proper instructions for safe and effective use.
9. Prescribe OTC medications for an optimal therapy.
10. Use pharmacy systems and technology that improve patient safety, pharmacy inventory management, drug / product storage, and medication distribution.
11. Interact effectively with patients, the public and health care professionals; including communication, interpretation and presentation of pharmaceutical information and data using appropriate listening, verbal, nonverbal, and written communication skills.
12. Perform according to professional and moral ethical codes and approaches considering laws of human rights as well as legal and safety guidelines.
13. Improve the pharmacist thinking, decision making and improve his problem solving abilities.
14. Manage time effectively.

## 1- Intended learning outcomes (ILOs) of the course:

### (A) Knowledge and Understanding:

Alignment Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **Knowledge and Understanding.**



Program Intended Learning Outcomes (Sub-PIOs) in: <b>Knowledge and Understanding</b>		Course Intended Learning Outcomes (CIOs) in: <b>Knowledge and Understanding</b>	
After completing this program, students would be able to:		After participating in the course, students would be able to:	
A4-	Recognize the basis of drug therapy (designing and monitoring) and its cost-effectiveness and the alternative therapy methods.	a1-	Familiar with the requirements and conditions of the storage for pharmaceuticals in the pharmacy and the process of ordering, receiving, pricing and returning medication products from wholesalers.
		a2-	Know factors that should drive the development of value-added pharmacy services

### Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment Learning Outcomes of Knowledge and Understanding to Teaching and Assessment Methods:			
Course Intended Learning Outcomes (CIOs) in Knowledge and Understanding After participating in the course, students would be able to:		Teaching strategies/methods to be used	Methods of assessment
a1-	Familiar with the requirements and conditions of the storage for pharmaceuticals in the pharmacy and the process of ordering, receiving, pricing and returning medication products from wholesalers.	<ul style="list-style-type: none"> <li>Practical Tutorials</li> <li>Computer- aided learning</li> </ul>	<ul style="list-style-type: none"> <li>✓ Objective Structured Practice Exam</li> <li>✓ Final Written Examinations</li> <li>✓ Oral Examinations</li> <li>✓ Written Reports</li> </ul>
a2-	Know factors that should drive the development of value-added pharmacy services.		

### (B) Intellectual Skills:

Alignment Course Intended Learning Outcomes (CIOs) to Program Intended Learning Outcomes (PIOs) in: <b>Intellectual skills</b>			
Program Intended Learning Outcomes (Sub-PIOs) in Intellectual skills		Course Intended Learning Outcomes (CIOs) of Intellectual Skills	
After completing this program, students would be able to:		After participating in the course, students would be able to:	
B1-	B1. Use various logic mental processes such as calculation, explanation, description, conclusion, and others in	b1-	Correlate pharmaceutical, biomedical and clinical knowledge to patient care.





	dealing with various phenomena/problems related to pharmacy works.		
<b>B2-</b>	Compare, differentiate and distinguish between related entities, phenomena and concepts and classify various entities based on certain properties.	<b>b2-</b>	Properly, interpret the pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.
		<b>b3-</b>	Retrieve drug information on key assigned concepts (brand/generic name, use, usual dosage form(s), route of administration, common adverse drug reactions, and major patient counseling points).
		<b>b4-</b>	Select appropriate management strategy for patients in different medical situations.

### Teaching And Assessment Methods For Achieving Learning Outcomes:

#### Alignment Learning Outcomes of Intellectual Skills to Teaching Methods and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Intellectual Skills. After participating in the course, students would be able to:		Teaching strategies/methods to be used.	Methods of assessment
<b>b1-</b>	Correlate pharmaceutical, biomedical and clinical knowledge to patient care.	<ul style="list-style-type: none"> <li>Practical Tutorials</li> <li>Problem-based learning</li> <li>Direct Patient Contact</li> <li>Role Modeling</li> </ul>	<ul style="list-style-type: none"> <li>✓ Objective Structured Practice Exam</li> <li>✓ Written Reports</li> <li>✓ Final Written Examinations</li> <li>✓ Oral Examinations</li> </ul>
<b>b2-</b>	Properly, interpret the pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.		
<b>b3-</b>	Retrieve drug information on key assigned concepts (brand/generic name, use, usual dosage form(s), route of administration, common adverse drug reactions, and major patient counseling points).		
<b>b4-</b>	Select appropriate management strategy for patients in different medical situations.		

### (C) Professional and Practical Skills.

#### Alignment Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Professional and Practical Skills

Program Intended Learning Outcomes (Sub- PILOs) in Professional and	Course Intended Learning Outcomes (CILOs) in Professional and Practical
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Practical Skills		Skills	
After completing this program, students would be able to:		After participating in the course, students would be able to:	
C1-	Commit to standard operation procedures (SOPs) and safety criteria during practicing pharmacy works in Laboratories, hospitals, pharmacies and drug factories.	c1-	Review a patient's medication profile to detect medication allergies, correct doses, duplicate medications, and important drug interactions.
		c2-	Provide level-appropriate counseling to patients, physician and/or other caregivers including proper instructions for safe and effective use.
		c3-	Prescribe OTC medications for an optimal therapy.
		c4-	Use pharmacy systems and technology that improve patient safety, pharmacy inventory management, drug / product storage, and medication distribution.

### Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment Learning Outcomes of Professional and Practical Skills to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills After participating in the course, students would be able to:		Teaching strategies/methods to be used	Methods of assessment
c1-	Review a patient's medication profile to detect medication allergies, correct doses, duplicate medications, and important drug interactions.	<ul style="list-style-type: none"> <li>Practical Tutorials</li> <li>Direct Patient Contact</li> <li>Role Modeling</li> <li>Problem-based learning</li> <li>Computer- aided learning</li> </ul>	<ul style="list-style-type: none"> <li>✓ Objective Structured Practice Exam</li> <li>✓ Oral Examinations</li> <li>✓ Final Written examinations</li> <li>✓ Written Reports</li> <li>✓ Practice Exam</li> </ul>
c2-	Provide level-appropriate counseling to patients, physician and/or other caregivers including proper instructions for safe and effective use.		
c3-	Prescribe OTC medications for an optimal therapy.		
c4-	Use pharmacy systems and technology that improve patient safety, pharmacy inventory management, drug / product storage, and medication distribution.		

### (D) General / Transferable skills .



Program Intended Learning Outcomes (PILOs) in General / Transferable skills			
After completing this program, students would be able to:			
D1-	Share successfully in teamwork & reporting activities.	d1-	Interact effectively with patients, the public and health care professionals; including communication, interpretation and presentation of pharmaceutical information and data using appropriate listening, verbal, nonverbal, and written communication skills.
D2-	Show respect to life and commit to community serving	d2-	Perform according to professional and moral ethical codes and approaches considering laws of human rights as well as legal and safety guidelines.
D3-	Communicate effectively with his/her colleagues,	d3-	Improve the pharmacist thinking, decision making and improve his problem solving abilities.
		d4-	Manage time effectively.
Teaching And Assessment Methods For Achieving Learning Outcomes:			
Alignment Learning Outcomes of General and Transferable skills to Teaching and Assessment Methods.			
Course Intended Learning Outcomes (CILOs) in General and Transferable Skills		Teaching strategies/methods to be used.	Methods of assessment
After participating in the course, students would be able to:			
d1-	Interact effectively with patients, the public and health care professionals; including communication, interpretation and presentation of pharmaceutical information and data using appropriate listening, verbal, nonverbal, and written communication skills.	<ul style="list-style-type: none"><li>▪ Practical Tutorials</li><li>▪ Direct Patient Contact</li><li>▪ Role Modeling</li><li>▪ Problem-based learning</li><li>▪ Computer- aided learning</li></ul>	✓ Objective Structured Practice Exam
d2-	Perform according to professional and moral ethical codes and approaches considering laws of human rights as well as legal and safety guidelines.		✓ Oral Examinations
d3-	Improve the pharmacist thinking, decision making and improve his problem solving abilities.		✓ Final Written examinations
d4-	Manage time effectively.		✓ Written Reports ✓ Practice Exam





## V. Course Contents:

No.	Units / Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact Hours
1.	<b>Review of pharmacy communication skills:</b>	a.1-a.2, b.1- b.2, b.4, c.1- c.4, d.1- d.4	➤ Model of communication, verbal and non-verbal communication, questioning skills, explaining skills, listening skills & counseling skills	1	25
2.	<b>Review of drug store management and inventory control:</b>	a.1-a.2, b.1- b.2, b.4, c.1- c.4, d.1- d.4	a). Organization of Drug store, types of materials stocked, storage conditions. b). Inventory control: a. Purchasing, b. Pricing, c. Outdated medications, d. Return to wholesaler e. Return to stock>Returns from patients, f. Recalls.	1	25
3.	<b>Prescription process</b>	a.1-a.2, b.1- b.2, b.4, c.1- c.4, d.1- d.4	Pharmacy workflow a. Receiving prescriptions b. Screening prescriptions c. Hand off to order entry Reviewing prescriptions a. Check allergies b. Clinical review/patient profile c. Check for correct drug, dose and route Legal Standards a. Prescription requirements (written and oral) b. Refillsc. controlled substance dispensing/ security formsd. Filing/record keeping for prescriptions, invoices, etc	1	25
4.	<b>Technology Systems in Pharmacy</b>	a.1-a.2, b.1- b.2, b.4, c.1- c.4, d.1- d.4	➤ Electronic system in Pharmacy	1	25
5.	<b>Drugs Used in Cardiovascular Diseases</b>	a.1, b.1- b.2, b.4, c.1- c.4, d.1- d.4	➤ Drugs used in hypertension, ischemic heart diseases, heart failure, dysrhythmias, shock	1	25
6.	<b>Drugs Used in Blood Diseases</b>	a.1, b.1- b.2, b.4,	➤ Drug used in thrombosis and bleeding, anemias, hyperlipidemia, peripheral vascular diseases	1	25



		c.1- c.4, d.1- d.4			
7.	<b>Drugs Used to Manage fever, Pain and Inflammation</b>	a.1, b.1- b.2, b.4, c.1- c.4, d.1- d.4	➤ Paracetamol, NSAIDs, glucocorticoids, disease modifying antirheumatic drugs,, methotrexate, anticytokines, colchicine, uricosuric agents and inhibitors of uric acid synthesis	1	25
8.	<b>Drugs Used in Diseases of Central Nervous System:</b>	a.1, b.1- b.2, b.4, c.1- c.4, d.1- d.4	➤ Drugs used in depression, psychosis, mania, bipolar disorder, ADHD, migraine, epilepsy,	1	25
9.	<b>Drugs Used in Diseases of Central Nervous System:</b>	a.1, b.1- b.2, b.4, c.1- c.4, d.1- d.4	➤ alzheimer and parkinson diseases, general and local anesthetics, sedatives, hypnotics, anxiolytics, opoid analgesics	1	25
10.	<b>Drugs Used in Endocrine Diseases:</b>	a.1, b.1- b.2, b.4, c.1- c.4, d.1- d.4	➤ Drugs used in diabetes mellitus, growth hormone disorders, infertility, osteoporosis, hypercalcemia, hyperprolactinemia	1	25
11.	<b>Drugs Used in Endocrine Diseases:</b>	a.1, b.1- b.2, b.4, c.1- c.4, d.1- d.4	➤ , thyroid diseases ➤ Oxytocin, vasopressin, desmopressin, mineralocorticoids, estrogens, antiestrogens, progestins, antiprogestins, contraceptive drugs, androgens, antiandrogens and .....	1	25
12.	<b>Drugs Used in Respiratory Diseases:</b>	a.1, b.1- b.4, c.1- c.4, d.1- d.4	Drugs used in pharmacotherapy of bronchial asthma, chronic obstructive pulmonary diseases, allergic rhinitis and cough	1	25
<b>Number of Weeks /and Units Per Semester</b>					<b>300</b>



## VI. Teaching strategies of the course:

1. Practical Tutorials (small group discussion)
2. Computer- based learning
3. Problem-based learning
4. Role Modeling
5. Direct Patient Contact

## VII. Assignments:

Assignments	Aligned CILOs (symbols)	Week Due	Mark
Written Reports	a.1, b.1, b3-b.4, c.1-c.4, d.1, d.3	2 <sup>nd</sup> , 4 <sup>th</sup> , 6 <sup>th</sup> , 8 <sup>th</sup> , 10 <sup>th</sup> , 12 <sup>th</sup> , 14 <sup>th</sup>	10

## VIII. Schedule of Assessment Tasks for Students during the Semester:

No.	Assessment Method	Aligned Course Learning Outcomes	Week Due	Mark	Proportion of Final Assessment
1.	Attendance, Participation and Activity	a.1-a.2, b.1- b.4, c.1- c.4, d.1- d.4	All Weeks	10	20%
2.	Written Reports	a.1, b.1, b3-b.4, c.1-c.4, d.1, d.3	2 <sup>nd</sup> , 4 <sup>th</sup> , 6 <sup>th</sup> , 8 <sup>th</sup> , 10 <sup>th</sup> , 12 <sup>th</sup> , 14 <sup>th</sup>	10	
3.	Oral Examinations	a.1-a.2, b.1-b.4, c.1-c.3, c.4, d.1- d.4	3 <sup>rd</sup> , 5 <sup>th</sup> , 7 <sup>th</sup> , 11 <sup>th</sup> , 15 <sup>th</sup>	10	10%
4.	Objective Structured Practice Exam	a.1, b.1-b.4, c.1- c.4, d.1- d.4	16 <sup>th</sup>	40	40%
5.	Final Written Examinations	a.1-a.2, b.1- b.4, c.1- c.3, d.3	16 <sup>th</sup>	30	30%
Total				100	100%



## IX. Learning Resources:

### 1- Required Textbook (s) (maximum two).

1. James, E.F, Reynolds, Parfitt, K., 2007, Martindale, "The extra pharmacopeia", 31<sup>st</sup> edition, Royal Pharmaceutical Society, London.
2. Roger Walker, Cate Whittlesea, 2011, Clinical Pharmacy and Therapeutics, 5<sup>th</sup> edition, Elsevier Health Sciences.

**Latest editions of all the suggested books are recommended.**

### 2- Essential References.

1. Remington's, The science and practice of pharmacy, 2000., Philadelphia college of pharmacy and science, 20<sup>th</sup> edition Philadelphia, USA,
2. John P. Rovers, Jay D. Currie, Harry P. Hagel, Randy P. McDonough, Jenelle L. Sobotka. 2003, A practical Guide to pharmaceutical care, 2<sup>nd</sup> edition., APhA Publications.

**Latest editions of all the suggested books are recommended.**

### 3- Electronic Materials and Web Sites etc.

websites:

1. [www.fda.gov](http://www.fda.gov)
2. <http://www.mhra.gov.uk/index.htm>
3. <http://jpet.aspetjournals.org>
4. <http://www.jpharmacol.com>
5. <http://www.sciencedirect.com>
6. <http://www.ncbi.nlm.nih.gov/pubmed>

## IX. Students' Support:

Office Hours/week	Other Procedures (if any)
Two contact hours per week	None

## X. Facilities Required:

<b>1 - Accommodation:</b>	<ul style="list-style-type: none"> <li>- Well-equipped lecture halls with data show facilities, whiteboards, net connection, etc.</li> <li>- Well-equipped laboratories with all required equipment and reagents.</li> </ul>
<b>2 - Computing resources:</b>	<ul style="list-style-type: none"> <li>- Computer laboratory with internet facilities.</li> </ul>

## XI. Course Improvement Processes:

### 1- Strategies for obtaining student feedback on effectiveness of teaching

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	<ul style="list-style-type: none"> <li>Student-based assessment of the effectiveness of teaching using a questionnaire designed by the Quality Assurance Unit at the end of the semester.</li> <li>Meeting with students and faculty (once per semester).</li> </ul>
<b>2- Other strategies for evaluation of teaching by the instructor or by the department.</b>	
	<ul style="list-style-type: none"> <li>Assessment of the course syllabus and contents by the teachers using a questionnaire designed by the Quality Assurance Unit of the university at the end of the semester.</li> <li>Regular meeting and discussion of the course content between the Head of Department and the teaching staff of the course (for theory and practice).</li> </ul>
<b>3- Processes for improvement of teaching.</b>	
	<ul style="list-style-type: none"> <li>Revision of the course specification and its teaching strategies every three academic years after consideration of all issues raised by the teachers and/or students during regular meetings and discussions.</li> <li>Exploring any possible defects in the course that might be encountered by the teaching staff and their mitigation in subsequent improved versions of course specification.</li> </ul>
<b>4- Processes for verifying standards of students' achievement</b>	
	<ul style="list-style-type: none"> <li>Checking of a sample of students' work by an independent faculty member.</li> <li>Periodic exchange and check marking of a sample of students' assignments with a faculty member from another institution.</li> <li>Adoption of scoring rubrics to assess the students' achievement (both for ongoing or summative assessments).</li> <li>Regular follow-up of laboratory logbooks to assess the practical achievement of students.</li> </ul>
<b>5- Procedures for periodically reviewing of course effectiveness and planning for improvement</b>	
	<ul style="list-style-type: none"> <li>Student rating and feedback</li> <li>Peer rating and feedback</li> <li>Regular meeting of the Curriculum Committee of the faculty.</li> </ul>
<b>6- Course development plans</b>	
	<ul style="list-style-type: none"> <li>Conducting regular workshops for the staff for improving their course specification skills.</li> <li>Regular revision of course specification and syllabus items.</li> </ul>





## XII. Course Policies: (including plagiarism, academic honesty, attendance etc)

The University Regulations on academic misconduct will be strictly enforced. Please refer to -----

1	<p><b>Class Attendance:</b></p> <ul style="list-style-type: none"> <li>- Attendance in all lectures and practical classes are required, except in very emergency circumstances, such as serious illness or death in the family with providing an acceptable documentation approved the university and forwarded by the chairman of the department. Otherwise the absence shall be considered unexcused.</li> <li>-In accordance with the university rules, if the percentage of student's absentness exceeds 25 % of the total lectures or practical classes, the student involved shall be disqualified in the final written and practical examination of the course and shall be deemed to have failed in the course.</li> </ul>
2	<p><b>Tardy:</b></p> <ul style="list-style-type: none"> <li>- Roll will be called in the very beginning of each lecture and practical class. Retardation for more than three weeks without a reasonable excursion, the student involved shall not be allowed to attend the class any longer and consequently shall be considered to be absent.</li> </ul>
3	<p><b>Exam Attendance/Punctuality:</b></p> <ul style="list-style-type: none"> <li>- It is incumbent on student to report at the examination hall for checking in and rolls calling at least 15 minutes before the commencement of examination.</li> <li>-A student is not allowed to submit answer booklet and leave the examination hall only on or after the passage of the have examination duration (equivalent to the first one hour after the commencement of the examination).</li> <li>-A student who comes late shall not be admitted to the examination hall, only within the first one hour of the examination. Attending after this time, the student will be considered to be missed in the examination and shall be deemed to have failed in the course.</li> </ul> <p>When a student misses the final examination due to a legitimate medical problems or death in the family, an acceptable documentation approved by the university medical unit for the excused absentness (hospitals medical reports along with discharge summaries or death certificate) must be provided no later than three weeks and consequently the student shall be disqualified in the examination but with the excused absentness.</p>
4	<p><b>Assignments &amp; Projects:</b></p> <ul style="list-style-type: none"> <li>- Micro-assignments and practical reports must be submitted for the assessment on or before the due date. If a student does not submit the micro-assignments or practical reports, the student shall be allotted zero marks which will affect the final assessment of the course.</li> </ul>



	<p>-The submission date extension will not be granted only by the consent of the faculty member concerned. In the case of late submission, the student must provide a reasonable explanation to the faculty member.</p> <p>Otherwise 1% of the obtained marks will be subtracted for each late day, including weekends and holidays.</p>
5	<p><b>Cheating:</b></p> <p>-If a student is found cheating in the final and med-term examinations and quizzes(copying from un authorized materials and anther students' work or allowing other students to copy from his/her own work), the student involved shall be disqualified in the examination and shall be deemed to have failed in the course and also suspended from examinations of two more courses.</p> <p>If a student if found engaging in any unauthorized communications (oral,sign,call,etc.), while the examination is in progress or in possessing of any authorized materials or electronic devices before the distribution of examination papers , the student involved shall be disqualified in the examination and shall be deemed to have failed the course.</p>
6	<p><b>Plagiarism:</b></p> <ul style="list-style-type: none"> <li>- Plagiarism is the presentation of any material (text, data or figures) from any other source in preparation of micro-assignments or practical reports without clear and adequate acknowledgement of the source.</li> <li>- Plagiarism is also the use or copy of other students' work (with, or without payment) to prepare all or part of undertaken micro-assignments or practical reports of work submitted for assessment.</li> </ul> <p>All types of plagiarism in are unacceptable and are considered of honest practices. If a student is found using plagiarism in devoted micro-assignments or reports , the student involved shall be subjected to the same penalties as in the case of cheating as already mentioned in the sub-section (5) of the course policies.</p>
7	<p><b>Other policies:</b></p> <ul style="list-style-type: none"> <li>- Students must switch off their mobile phones, labtops, electronic devices etc. before entering lecture room or laboratory. If a student is found using these devices while the lecture or practical work is in progress, the student involved shall be expelled out of the class and shall be considered to be absent. Note that students can submit their micro-assignments or practical reports through the e-mail address of the faculty member concerned and should be prudent to keep Photostat or electronic copies of submitted works to guard against an accidental loss.</li> </ul>







## Course Specification

### Pharmaceutical MEDICINAL CHEMSITRY I

I. Course Identification and General Information:							
1.	Course Title:	Pharmaceutical MEDICINAL CHEMSITRY I					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( FOURTH ) Year – ( 1 <sup>st</sup> ) semester					
5.	Pre –requisite (if any):	• Pharmaceutical organic chemistry I , II					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course provides an introduction to chemistry of medicinal agents. The course also deals with the physicochemical properties, chemical synthesis, structure activity relationship (SAR), and metabolism of drugs affecting autonomic nervous system and skeletal muscles.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explain the correlation between the chemical properties of drugs and their synthesis, identification, biological activity (SAR) and metabolism
2.		a2. Determine physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of drugs affecting autonomic nervous system, skeletal muscles.
3.	A3	a3. Discuss the principles of chemical synthesis, nomenclature, identification, SAR, metabolic reactions of drugs.
4.		a4. Explicit the theories of drug-receptor interaction and the chemistry of drug metabolism.
5.	A4	a5. Comprehend his/her role as a pharmacist in synthesis, designing and identification of drugs.
6.	B1	b1. Differentiate between chemically related drugs.
7.		b2. Interpret the chemical modification applied on parent drugs to produce newer drugs.
8.		b3. Solve chemical problems related to identification, reactions, metabolism of drugs affecting autonomic nervous system, skeletal muscles and drugs used for eye and alimentary system disorders.
9.	B2	b4. Classify drugs affecting autonomic nervous system, skeletal muscles chemically and therapeutically.
10.		b5. Compare between chemically related drugs based on their chemical structure and biological activity.
11.	B3	b6. Relate biological activity of drugs to their chemical structure.
12.		b7. Design newer drugs from patent/parent drugs.
13.		b8. Predict the outcomes of reactions, metabolism of drugs and chemical modification if occur in parent drugs.
14.	B4	b9. Assess the appropriateness of chemical modification present in newer drugs in comparison to parent drugs.
15.	C1	c1. Handle efficiently the tools and chemicals used in medicinal chemistry Lab.
16.		c2. Operate successfully the instruments used in medicinal chemistry Lab.
17.	C2	c3. Perform effectively the experiments, practical tasks and including



		drug synthesis , identification and purification of drugs using pharmacopeial procedures.
18.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
19.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
20.	C4	c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
21.	D1	d1. Share successfully in team-work.
22.	D2	d2. Show respect to life& Behave in discipline during practicing practical and professional works and assignments.
23.	D3	d3. Communicate effectively with his/her colleagues.
24.	D4	d4. Demonstrate the ability of time management and self-learning.

## 1. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a3, a4	Lecture	Written exam , Attendance
a5	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)



b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5, b6, b7	Lecture	Written exam , Attendance, quizzes
b8	Lecture	Written exam , Attendance
b9	Lecture	Written exam , Attendance
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning , Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to medicinal chemistry</b>	a1, a3, a4, a5, b1, b2, b5, b9	<ul style="list-style-type: none"> <li>definitions, brief history, roles in pharmacy.</li> <li>Physicochemical properties in relation to biological activity (structure-activity relationship "SAR").</li> <li>Basics of chemical drug designing : patent burst, synthesis of fragments, etc.</li> </ul>	1	2
2	<b>Drug-receptor interaction &amp; Stereochemistry of drugs</b>	a3, a4 , b3	<ul style="list-style-type: none"> <li>binding and drug-receptor interaction : chemical bonding and biological activity</li> <li>stereochemical aspects of drug action</li> <li>isosterism and bioisosterism</li> </ul>	1	2
3	<b>chemistry of Drug metabolism</b>	a4, a5, b1, b3	<ul style="list-style-type: none"> <li>phase I reactions</li> <li>phase II reactions</li> <li>Metabolites: inactive, active , more active</li> </ul>	1	2
4	<b>Drugs acting on the autonomic nervous system</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of drugs acting on sympathetic system</b> <ul style="list-style-type: none"> <li>Indirectly sympatholytic drugs</li> <li>Directly sympatholytic drugs : adrenergic blocking agents</li> <li>Indirectly sympatholytic drugs</li> <li>Directly sympatholytic drugs : adrenergic blocking agents</li> </ul>	4	8
	<b>MIDTERM EXAM</b>			1	2
		a1, a2,a3 , b1, b2, b3, b4,	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of drugs acting on parasympathetic system</b>	3	6



		b5, b8, b9, d2	<ul style="list-style-type: none"> <li>Indirectly parasympathomimetics</li> <li>Direct parasympathomimetics : cholinergic agonists</li> <li>Indirectly parasympatholytic drugs</li> <li>Directly sympatholytic drugs : cholinergic blocking agents</li> <li><b>Drugs acting on autonomic ganglia:</b> Ganglionic stimulants, ganglionic</li> </ul>		
5	<b>Drugs affecting skeletal muscles</b>	a1, a2, a3, b1, b2, b3, b4, b5, b8, b9, d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of drugs acting on parasympathetic system</b> <ul style="list-style-type: none"> <li>Neuromuscular blocking agents</li> <li>Central muscles relaxants</li> </ul>	3	6
	<b>Course Review</b>	a1, a2, a3, b1, b2, b3, b4, b5, b8, b9, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units



B - Practical Aspect:				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	introduction to pharmaceutical organic chemistry Lab.: safety requirements, list of experiments, How to report, etc.	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
2.	Pharmacopeial physicochemical properties , identification of: adrenergic agonist : <b>adrenaline</b> , <b>pseudoephedrine</b>	2	4	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
3.	Pharmacopeial physicochemical properties , identification of : adrenergic blockers : <b>propranolol</b> , <b>atenolol</b> ,	2	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
4.	Pharmacopeial physicochemical properties , identification of : parasympathomimetics : <b>neostigmine</b>	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
5.	Pharmacopeial physicochemical properties , identification of : cholinergic blockers : <b>atropine</b>	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
6.	Pharmacopeial physicochemical properties , identification of : skeletal muscle relaxants <b>suxamethonium</b>	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
7.	Pharmacopeial physicochemical properties , identification of : drugs used for eye disorders : <b>pilocarpine</b>	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
8.	Synthesis of drugs	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
9.	Purification of drugs.	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, c6,	4-13	3
2	<b>Group</b> : each group of students will be assigned to hypothetically design newer drugs form a studied patent drug using SAR principles	b7, c5, c6, d1, d3,	14	2





## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b8, b9, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b3, b7, c5, c6, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a3, a4, a5, b1, b2, b3, b5, b9
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b8, b9, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b3, c1, c2, c3, c4, c6,
4	Lab. Reporting	weekly	3	2	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b3, c1, c2, c3, c4, c6,
6	Practical exam (practical)	14	20	20	a2, b1, b3, c1, c2, c3, c4, c6,
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Gareth Thomas, Medicinal chemistry: an introduction to, 2007 John Wiley & Sons Ltd.
2. Siddique. A textbook of medicinal chemistry

### 2- Essential References.

1. AshutochKar. Medicinal chemistry, 2007, New age international publisher
2. Rajie. Pharmaceutical chemistry
3. Wermuth. The practice of medicinal chemistry

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of MEDICIANL CHEMISTRY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course provides an introduction to chemistry of medicinal agents. The course also deals with the physicochemical properties, chemical synthesis, structure activity relationship (SAR), and metabolism of drugs affecting autonomic nervous system and skeletal muscles.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explain the correlation between the chemical properties of drugs and their synthesis, identification, biological activity (SAR) and metabolism
2.		a2. Determine physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of drugs affecting autonomic nervous system, skeletal muscles.
3.	A3	a3. Discuss the principles of chemical synthesis, nomenclature, identification, SAR, metabolic reactions of drugs.
4.		a4. Explicit the theories of drug-receptor interaction and the chemistry of drug metabolism.
5.	A4	a5. Comprehend his/her role as a pharmacist in synthesis, designing and identification of drugs.
6.	B1	b1. Differentiate between chemically related drugs.
7.		b2. Interpret the chemical modification applied on parent drugs to produce newer drugs.
8.		b3. Solve chemical problems related to identification, reactions, metabolism of drugs affecting autonomic nervous system, skeletal muscles and drugs used for eye and alimentary system disorders.
9.	B2	b4. Classify drugs affecting autonomic nervous system, skeletal muscles chemically and therapeutically.
10.		b5. Compare between chemically related drugs based on their chemical structure and biological activity.
11.	B3	b6. Relate biological activity of drugs to their chemical structure.
12.		b7. Design newer drugs from patent/parent drugs.
13.		b8. Predict the outcomes of reactions, metabolism of drugs and chemical modification if occur in parent drugs.
14.	B4	b9. Assess the appropriateness of chemical modification present in newer drugs in comparison to parent drugs.
15.	C1	c1. Handle efficiently the tools and chemicals used in medicinal chemistry Lab.
16.		c2. Operate successfully the instruments used in medicinal chemistry Lab.
17.	C2	c3. Perform effectively the experiments, practical tasks and including



		drug synthesis , identification and purification of drugs using pharmacopeial procedures.
18.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
19.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
20.	C4	c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
21.	D1	d1. Share successfully in team-work.
22.	D2	d2. Show respect to life& Behave in discipline during practicing practical and professional works and assignments.
23.	D3	d3. Communicate effectively with his/her colleagues.
24.	D4	d4. Demonstrate the ability of time management and self-learning.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a3, a4	Lecture	Written exam , Attendance
a5	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)



b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5, b6, b7	Lecture	Written exam , Attendance, quizzes
b8	Lecture	Written exam , Attendance
b9	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning , Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to medicinal chemistry</b>	a1, a3, a4, a5, b1, b2, b5, b9	<ul style="list-style-type: none"> <li>definitions, brief history, roles in pharmacy.</li> <li>Physicochemical properties in relation to biological activity (structure-activity relationship "SAR").</li> <li>Basics of chemical drug designing : patent burst, synthesis of fragments, etc.</li> </ul>	1	2
2	<b>Drug-receptor interaction &amp; Stereochemistry of drugs</b>	a3, a4 , b3	<ul style="list-style-type: none"> <li>binding and drug-receptor interaction : chemical bonding and biological activity</li> <li>stereochemical aspects of drug action</li> <li>isosterism and bioisosterism</li> </ul>	1	2
3	<b>chemistry of Drug metabolism</b>	a4, a5, b1, b3	<ul style="list-style-type: none"> <li>phase I reactions</li> <li>phase II reactions</li> <li>Metabolites: inactive, active , more active</li> </ul>	1	2
4	<b>Drugs acting on the autonomic nervous system</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of drugs acting on sympathetic system</b> <ul style="list-style-type: none"> <li>Indirectly sympatholytic drugs</li> <li>Directly sympatholytic drugs : adrenergic blocking agents</li> <li>Indirectly sympatholytic drugs</li> <li>Directly sympatholytic drugs : adrenergic blocking agents</li> </ul>	4	8
	<b>MIDTERM EXAM</b>			1	2
		a1, a2,a3 , b1, b2, b3, b4, b5, b8,	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of drugs acting on parasympathetic system</b> <ul style="list-style-type: none"> <li>Indirectly parasympathomimetics</li> </ul>	3	6



		b9,d2	<ul style="list-style-type: none"> <li>• Direct parasympathomimetics : cholinergic agonists</li> <li>• Indirectly parasympatholytic drugs</li> <li>• Directly sympatholytic drugs : cholinergic blocking agents</li> <li>• <b>Drugs acting on autonomic ganglia:</b> Ganglionic stimulants, ganglionic</li> </ul>		
5	<b>Drugs affecting skeletal muscles</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of drugs acting on parasympathetic system</b> <ul style="list-style-type: none"> <li>• Neuromuscular blocking agents</li> <li>• Central muscles relaxants</li> </ul>	3	6
	<b>Course Review</b>	a1, a2, a3, b1, b2, b3, b4, b5, b8, b9, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units





B - Practical Aspect:				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	introduction to pharmaceutical organic chemistry Lab.: safety requirements, list of experiments, How to report, etc.	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
2.	Pharmacopeial physicochemical properties , identification of: adrenergic agonist : <b>adrenaline</b> , <b>pseudoephedrine</b>	2	4	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
3.	Pharmacopeial physicochemical properties , identification of : adrenergic blockers : <b>propranolol</b> , <b>atenolol</b> ,	2	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
4.	Pharmacopeial physicochemical properties , identification of : parasympathomimetics : <b>neostigmine</b>	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
5.	Pharmacopeial physicochemical properties , identification of : cholinergic blockers : <b>atropine</b>	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
6.	Pharmacopeial physicochemical properties , identification of : skeletal muscle relaxants <b>suxamethonium</b>	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
7.	Pharmacopeial physicochemical properties , identification of : drugs used for eye disorders : <b>pilocarpine</b>	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
8.	Synthesis of drugs	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
9.	Purification of drugs.	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, c6,	4-13	3
2	<b>Group</b> : each group of students will be assigned to hypothetically design newer drugs form a studied patent drug using SAR principles	b7, c5, c6, d1, d3,	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b8, b9, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b3, b7, c5, c6, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a3, a4, a5, b1, b2, b3, b5, b9
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b8, b9, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b3, c1, c2, c3, c4, c6,
4	Lab. Reporting	weekly	3	2	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b3, c1, c2, c3, c4, c6,
6	Practical exam (practical)	14	20	20	a2, b1, b3, c1, c2, c3, c4, c6,
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Gareth Thomas, Medicinal chemistry: an introduction to, 2007 John Wiley & Sons Ltd.
2. Siddique. A textbook of medicinal chemistry

### 2- Essential References.

1. AshutochKar. Medicinal chemistry, 2007, New age international publisher
2. Rajie. Pharmaceutical chemistry
3. Wermuth. The practice of medicinal chemistry

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### Pharmaceutical MEDICINAL CHEMSITRY II

I. Course Identification and General Information:							
1.	Course Title:	Pharmaceutical MEDICINAL CHEMSITRY II					
2.	Course Code &Number:	PM324					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( FOURTH ) Year – ( SECOND ) semester					
5.	Pre –requisite (if any):	• Medicinal chemistry I					
6.	Co –requisite (if any):	• Pharmacology II					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of synthesis, structure activity relationship (SAR), and metabolism of drugs used for eye disorders, alimentary system disorders, respiratory, & cardiovascular systems disorders.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Align CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explain the correlation between the chemical properties of drugs and their synthesis, identification, biological activity (SAR) and metabolism
2.		a2. Determine physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of drugs used for eye disorders, alimentary system disorders, respiratory, & cardiovascular systems disorders..
3.	A4	a3. Comprehend his/her role as a pharmacist in synthesis, designing and identification of drugs.
4.	B1	b1. Differentiate between chemically related drugs.
5.		b2. Interpret the chemical modification applied on parent drugs to produce newer drugs.
6.		b3. Solve chemical problems related to identification, reactions, metabolism of drugs used for eye disorders, alimentary system disorders, respiratory, & cardiovascular systems disorders..
7.	B2	b4. Classify drugs used for eye disorders, alimentary system disorders, respiratory, & cardiovascular systems disorders chemically and therapeutically.
8.		b5. Compare between chemically related drugs based on their chemical structure and biological activity.
9.		b6. Relate biological activity of drugs to their chemical structure.
10.		b7. Design newer drugs from patent/parent drugs.
11.	B3	b8. Predict the outcomes of reactions, metabolism of drugs and chemical modification if occur in parent drugs..
12.	B4	b9. Assess the appropriateness of chemical modification present in newer drugs in comparison to parent drugs.
13.	C1	c1. Handle efficiently the tools and chemicals used in medicinal chemistry Lab.
14.		c2. Operate successfully the instruments used in medicinal chemistry Lab.
15.	C2	c3. Perform effectively the experiments, practical tasks and including drug synthesis, identification and purification of drugs using pharmacopeial procedures.



16.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Show respect to life & behave in discipline during practicing practical and professional works and assignments.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4. Demonstrate the ability of time management and self-learning.

## 1. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
,	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance
		Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)



b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5, b6, b7	Lecture	Written exam , Attendance, quizzes
b8	Lecture	Written exam , Attendance
b9	Lecture	Written exam , Attendance
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning , Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments





IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	Ophthalmic drugs	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of drugs acting on parasympathetic system</b> <ul style="list-style-type: none"> <li>• Parasympathomimetic and parasympatholytics agents used for eye disorders.</li> <li>• Adrenergic agonists and antagonists used for eye disorders</li> <li>• Carbonic anhydrase inhibitors</li> <li>• Prostaglandin analogues</li> <li>• Osmotic agents</li> </ul> <i>" Topics of Anti-inflammatory, antihistamins, antibiotics used for eye disorders will be discussed in next courses"</i>	3	6
2	Drugs for alimentary system disorders	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Antacids and Drugs for Peptic Ulcer</li> <li>• Anti- emetics</li> <li>• Laxatives</li> <li>• Anti-diarrheal</li> <li>• Antispasmodics</li> <li>• Drugs for irritable colon</li> <li>• Hepatic protectives</li> <li>• Drugs for gall bladder disorders</li> </ul>	3	6
	<b>MIDTERM EXAM</b>			1	2
3	Drugs acting on respiratory system	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Drugs for common cold : nasal decongestant , antihistamines</li> <li>• Drugs for cough</li> <li>• Drugs for bronchial asthma</li> </ul>	3	6



4	<b>Cardiovascular system drugs</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Diuretics and Antihypertensive</li> <li>• Hypertensives</li> <li>• Antianginal and drugs for myocardial infarction</li> <li>• Drugs for congestive heart failure</li> <li>• antiarrhythmics</li> </ul>	4	8
	<b>Course Review</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	4 Units



<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	AlignedCourse Intended Learning Outcomes CILOs
1.	Pharmacopeial physicochemical properties , identification of : drugs used for eye disorders : <b>pilocarpine eye drops.</b>	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2.	Pharmacopeial physicochemical properties , identification of : antipeptic ulcer : omeprazole	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
3.	Pharmacopeial physicochemical properties , identification of : antispasmodics : mebeverine	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
4.	Pharmacopeial physicochemical properties , identification of : expectorants : guaphensin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
5.	Pharmacopeial physicochemical properties , identification of : antitussive : codeine	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
6.	Pharmacopeial physicochemical properties , identification of: bronchodilators : aminophylline	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
7.	Pharmacopeial physicochemical properties , identification: Diuretics : Furosemide	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
8.	Pharmacopeial physicochemical properties , identification of : Antihypertensives : amlodipine	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
9.	<b>Synthesis of drugs</b>	2	4	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
10.	<b>Purification of drugs.</b>	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
PRACTICAL EXAM		1	2	
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to hypothetically design newer drugs form a studied patent drug using SAR principles	b7, c5, c6, d1, d3, d5	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, , , a3,b1, b2, b3, b4, b5, b8, b9, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b3, b7, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, , , a3, b1, b2, b3,b5, b9
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, , a3,b1, b2, b3, b4, b5, b8, b9, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
6	Practical exam (practical)	14	20	20	a2,b1, b3, c1, c2, c3, c4, c6, d5
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Gareth Thomas, Medicinal chemistry: an introduction to, 2007 John Wiley & Sons Ltd
2. Siddique. A textbook of medicinal chemistry

### 2- Essential References.

1. AshutochKar. Medicinal chemistry, 2007, New age international publisher
2. Rajie. Pharmaceutical chemistry
3. Wermuth. The practice of medicinal chemistry

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of MEDICIANL CHEMISTRY II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of synthesis, structure activity relationship (SAR), and metabolism of drugs used for eye disorders, alimentary system disorders, respiratory, & cardiovascular systems disorders.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignent CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explain the correlation between the chemical properties of drugs and their synthesis, identification, biological activity (SAR) and metabolism
2.		a2. Determine physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of drugs used for eye disorders, alimentary system disorders, respiratory, & cardiovascular systems disorders..
3.	A4	a3. Comprehend his/her role as a pharmacist in synthesis, designing and identification of drugs.
4.	B1	b1. Differentiate between chemically related drugs.
5.		b2. Interpret the chemical modification applied on parent drugs to produce newer drugs.
6.		b3. Solve chemical problems related to identification , reactions, metabolism of drugs used for eye disorders, alimentary system disorders, respiratory, & cardiovascular systems disorders..
7.	B2	b4 .Classify drugs used for eye disorders, alimentary system disorders, respiratory, & cardiovascular systems disorders chemically and therapeutically.
8.		b5. Compare between chemically related drugs based on their chemical structure and biological activity.
9.		b6. Relate biological activity of drugs to their chemical structure.
10.		b7. Design newer drugs from patent/parent drugs.
11.	B3	b8. Predict the outcomes of reactions , metabolism of drugs and chemical modification if occur in parent drugs..
12.	B4	b9 . Assess the appropriateness of chemical modification present in newer drugs in comparison to parent drugs.
13.	C1	c1.Handle efficiently the tools and chemicals used in medicinal chemistry Lab.
14.		c2. Operate successfully the instruments used in medicinal chemistry Lab.
15.	C2	c3 . Perform effectively the experiments , practical tasks and including drug synthesis , identification and purification of drugs using pharmacopeial procedures.





16.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Show respect to life & behave in discipline during practicing practical and professional works and assignments.
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4. Demonstrate the ability of time management and self-learning.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
,	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance
		Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)



b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5, b6, b7	Lecture	Written exam , Attendance, quizzes
b8	Lecture	Written exam , Attendance
b9	Lecture	Written exam , Attendance
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning , Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments



IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	Ophthalmic drugs	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of drugs acting on parasympathetic system</b> <ul style="list-style-type: none"> <li>• Parasympathomimetic and parasympatholytics agents used for eye disorders.</li> <li>• Adrenergic agonists and antagonists used for eye disorders</li> <li>• Carbonic anhydrase inhibitors</li> <li>• Prostaglandin analogues</li> <li>• Osmotic agents</li> </ul> <p><i>" Topics of Anti-inflammatory, antihistamins, antibiotics used for eye disorders will be discussed in next courses"</i></p>	3	6
2	Drugs for alimentary system disorders	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Antacids and Drugs for Peptic Ulcer</li> <li>• Anti- emetics</li> <li>• Laxatives</li> <li>• Anti-diarrheal</li> <li>• Antispasmodics</li> <li>• Drugs for irritable colon</li> <li>• Hepatic protectives</li> <li>• Drugs for gall bladder disorders</li> </ul>	3	6
	<b>MIDTERM EXAM</b>			1	2
3	Drugs acting on respiratory system	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Drugs for common cold : nasal decongestant , antihistamines</li> <li>• Drugs for cough</li> <li>• Drugs for bronchial asthma</li> </ul>	3	6



4	<b>Cardiovascular system drugs</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Diuretics and Antihypertensive</li> <li>• Hypertensives</li> <li>• Antianginal and drugs for myocardial infarction</li> <li>• Drugs for congestive heart failure</li> <li>• antiarrhythmics</li> </ul>	4	8
	<b>Course Review</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	4 Units



<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	AlignedCourse Intended Learning Outcomes CILOs
1.	Pharmacopeial physicochemical properties , identification of : drugs used for eye disorders : <b>pilocarpine eye drops.</b>	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2.	Pharmacopeial physicochemical properties , identification of : antipeptic ulcer : omeprazole	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
3.	Pharmacopeial physicochemical properties , identification of : antispasmodics : mebeverine	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
4.	Pharmacopeial physicochemical properties , identification of : expectorants : guaphensin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
5.	Pharmacopeial physicochemical properties , identification of : antitussive : codeine	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
6.	Pharmacopeial physicochemical properties , identification of: bronchodilators : aminophylline	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
7.	Pharmacopeial physicochemical properties , identification: Diuretics : Furosemide	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
8.	Pharmacopeial physicochemical properties , identification of : Antihypertensives : amlodipine	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
9.	<b>Synthesis of drugs</b>	2	4	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
10.	<b>Purification of drugs.</b>	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
PRACTICAL EXAM		1	2	
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.

The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to hypothetically design newer drugs form a studied patent drug using SAR principles	b7, c5, c6, d1, d3, d5	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, , , a3,b1, b2, b3, b4, b5, b8, b9, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b3, b7, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, , , a3, b1, b2, b3,b5, b9
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, , a3,b1, b2, b3, b4, b5, b8, b9, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
6	Practical exam (practical)	14	20	20	a2,b1, b3, c1, c2, c3, c4, c6, d5
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Gareth Thomas, Medicinal chemistry: an introduction to, 2007 John Wiley & Sons Ltd.
2. Siddique. A textbook of medicinal chemistry

### 2- Essential References.

1. AshutochKar. Medicinal chemistry, 2007, New age international publisher
2. Rajie. Pharmaceutical chemistry
3. Wermuth. The practice of medicinal chemistry

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.





## Course Specification

### **COMMUNITY PHARMACY&PHARMCY PRACTICE**

I. Course Identification and General Information:							
1.	Course Title:	COMMUNITY PHARMACY&PHARMCY PRACTICE					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( FOURTH) Year – ( 1ST ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"><li>Pharmaceutics I, II , III , IV</li><li>pharmacology I, II , III,IV</li></ul>					
6.	Co –requisite (if any):	<ul style="list-style-type: none"><li>FIELD training I</li></ul>					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course is designed to provide the students the necessary knowledge and skills for as professional practicing of pharmacy especially in community pharmacies. This course is alongside with the " Pharmacy training I" course .



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Determine the essential drug product specifications: employed in community pharmacies such as trade names, dosage forms available, strength, pharmaceutical companies.
2.		a2. Determine types of medications dispensed without the need of medical prescriptions (OTC medications) and the types of extemporaneous preparations prepared by the pharmacist in pharmacy Lab.
3.	A3	a3. Grasp the regulations of dispensing of medications.
4.	A4	a4. Comprehend his/her role as a pharmacist in community pharmacists in serving patients and management of pharmacy.
5.	B1	b1. Differentiate between OTC medications and other medications.
6.		b2. Compare between medications therapeutically, pharmaceutically and commercially.
7.	B4	b3 . Assess the patient case and the requirement to physician referral or not.
8.		b4. Select the most appropriate OTC medications for minor patient cases.
9.	C2	c1. Recommend patients to use appropriate OTC medications and to correctly administer their medications
10.		c2. Dispense medications correctly and efficiently using standard procedures/
11.		c3. Administer pharmacy effectively and arrange medications in the pharmacy efficiently.
12.	C4	c4 .Search efficiently for information using documented and electronic sources of information.
13.		c5. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Share successfully in team-work.
15.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
16.	D3	d3. Communicate effectively with his/her colleagues and patients.
17.	D4	d4. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
a3, a4	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	Lecture , laboratory practice, feed-back learning	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2, c3,	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), assignments
c4	feed-back learning, Group-project	Assignments
c5	laboratory practice, feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
-----------------------------------	---------------------	-----------------------



d1, d3, d4	laboratory practice , feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam), assignments
d2	Lecture	Written exam , Attendance

#### IV. Course Content:

##### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b2, d2	<input type="checkbox"/> Filed of pharmacy practices, community pharmacy practice: objectives, requirements (pharmacist skills, knowledge, source of information: medical indexes "BNF", personal elegance ). <input type="checkbox"/> drug product specifications: generic name, strength, trade name, manufacturer, country, leaflet components, Services offered to patients in community pharmacies (in brief)	1	2
2	<b>Skills and knowledge of Dispensing medication</b>	a2, a4, c2, d2	<input type="checkbox"/> Items (details) of medical prescription <input type="checkbox"/> Skills of dispensing : Standard Operating procedures (SOPs) of preparing a prescription: : careful reading, identifying the items of the prescription, checking of legality, making necessary calculation, checking, bringing medication, second checking, packaging, giving necessary instructions, answering patient's	1	2



			<p>questions</p> <p><input type="checkbox"/> Case studies and training on the SOPs of dispensing: examples of written prescriptions</p>		
3	<b>Specific requirements for dispensing of controlled medications</b>	a2, a4, c2, d2	<p><input type="checkbox"/> Types of medications : Prescription Only medications (POMs) risks and need of awareness !</p> <p><input type="checkbox"/> Types of controlled drugs</p> <p><input type="checkbox"/> Regulations for prescription: legal prescribers, legally signed</p> <p><input type="checkbox"/> Prescription forms</p> <p><input type="checkbox"/> Addict (installment) prescriptions for controlled drugs</p> <p><input type="checkbox"/> Requisitions forms</p> <p><input type="checkbox"/> Record-keeping on a register ( example of a register form)</p> <p><input type="checkbox"/> Case study: training on controlled drug prescriptions</p>	1	2
4	<b>Recommending of OTC medications in response to symptoms</b>	a2, , b1, a4, b2, b3, b4, c1, d2	<p><input type="checkbox"/> Types of medications (OTC) dispensed without a prescription.</p> <p><input type="checkbox"/> Factors to be considered when responding to symptoms in the pharmacy.</p> <p><input type="checkbox"/> Observation of patient`s symptoms</p> <p><input type="checkbox"/> Making a differential diagnosis</p> <p><input type="checkbox"/> acronyms (SIT, ASMETHOD, ENCORE )used when responding to symptoms in a pharmacy</p> <p><input type="checkbox"/> Taking a case history</p> <p><input type="checkbox"/> Case study examples</p> <p><input type="checkbox"/> OTC products for alimentary and respiratory disorders</p>	5	10
<b>MID-TERM EXAM</b>				1	2
5	<b>Preparation and dispensing of extemporaneous products</b>	a2, a4, d2	<p><input type="checkbox"/> Types of extemporaneous preparations: from raw materials, from dosage forms (e.g. preparations of oral liquids from capsules, tablets and injectons) <input type="checkbox"/> Requirements of pharmaceutical lab. In the pharmacy <input type="checkbox"/> Information references e.g. British</p>	2	4



			pharmacopeia <input type="checkbox"/> Challenge and troubles: Ingredients quality, stability, quality control testing <input type="checkbox"/> Packaging of extemporaneous preparations		
6	<b>Patient`s counseling</b>	a4, b3, b4, c1, d2, d3, d2	<input type="checkbox"/> Skills for patients counseling: communication with the patient <input type="checkbox"/> Products-specific counseling points: explaining to the patient how to use (apply and take dose) of the following products correctly and what precautions should he/she avoid <input type="checkbox"/> Ophthalmic preparations: eye drops and ointments. <input type="checkbox"/> Nasal drops and sprays <input type="checkbox"/> Inhalers <input type="checkbox"/> Oral products: tablets, capsules, liquids, powders/granules <input type="checkbox"/> Suppositories, pessaries and vaginal creams <input type="checkbox"/> Topical dermatological preparations	1	2
7	<b>Pharmacy administration</b>	a4, d2	<input type="checkbox"/> Documentation, indexing <input type="checkbox"/> Pricing, procurement, selling <input type="checkbox"/> Stock control <input type="checkbox"/> Storage areas I community pharmacy	2	4
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2, c3, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	7 Units



<b>B - Practical Aspect: The practical sections are carried out in the " Virtual pharmacy Lab"</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	Drug product specification	2	4	a1, a4, b2, c5, d1, d2, d3, , d4, d5
2.	Arrangement of medication in community pharmacy	2	4	a4, c3, c5, d1, d2, d3, , d4, d5
3.	OTC medications	2	4	a2, a4, b1, b2, d1, d2, d3, , d4, d5
4.	Prescription only medications and controlled drugs.	1	2	a4, b2, c5, d1, d2, d3, , d4, d5
5.	Skills of dispensing	1	2	a3, a4, c2, c5, d1, d2, d3, , d4, d5
6.	Patient`s counseling	2	4	a4, b3, b4, c1, d1, d2, d3, , d4, d5
7.	Pharmacy administration skills	1	2	c3, c5, d1, d2, d3, , d4, d5
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on a type of OTC medications	c4, c5, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a booklet of drug index of the a commercial drug products s of 1-2 drug categories.	c4, c5, d1, d3, d5	14	2





## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2, c3, d2
2	Assignments (1 + 2)	4, 14	5	5	c4, c5, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b4
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a4, b1, b2, b3, b4, c1, c2, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2, c3, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, a4, b1, b2, b3, c1, c2, c3, c5, d1, d2, d3, , d4, d5
2	Lab. Attitude	weekly	2.5	2.5	c6, d1, d3, d4
3	Lab. Accomplishments	weekly	2.5	2.5	a1, a2, a4, b1, b2, b3, c1, c2, c3, c5
4	Lab. Reporting	weekly	5	5	c5
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, a4, b1, b2, b3, c1, c2, c3, c5
6	Practical exam (practical)	14	20	20	a1, a2, a4, b1, b2, b3, c1, c2, c3,



					c5
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Lillian M Azzopardi. Lecture notes on pharmacy practice, 2010, Pharmaceutical press.Christopher
2. A Langley, Dawn Belcher. Applied pharmaceutical skills, 2009, Pharmaceutical press.

### 2- Essential References.

1. Agarwal. Dispensing and community pharmacy
2. Jain. A text book of professional pharmacy

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### COMMUNITY PHARMACY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course is designed to provide the students the necessary knowledge and skills for as professional practicing of pharmacy especially in community pharmacies. This course is alongside with the " Pharmacy training I" course .



<b>III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies</b>		
<b>3. Alignment CILOs to PILOs</b>		
<b>No.</b>	<b>PILOs</b>	<b>CILOs</b>
1.	<b>A2</b>	<b>a1.</b> Determine the essential drug product specifications: employed in community pharmacies such as trade names, dosage forms available, strength, pharmaceutical companies.
2.		<b>a2.</b> Determine types of medications dispensed without the need of medical prescriptions (OTC medications) and the types of extemporaneous preparations prepared by the pharmacist in pharmacy Lab.
3.	<b>A3</b>	<b>a3.</b> Grasp the regulations of dispensing of medications.
4.	<b>A4</b>	<b>a4.</b> Comprehend his/her role as a pharmacist in community pharmacists in serving patients and management of pharmacy.
5.	<b>B1</b>	<b>b1.</b> Differentiate between OTC medications and other medications.
6.		<b>b2.</b> Compare between medications therapeutically, pharmaceutically and commercially.
7.	<b>B4</b>	<b>b3 .</b> Assess the patient case and the requirement to physician referral or not.
8.		<b>b4.</b> Select the most appropriate OTC medications for minor patient cases.
9.	<b>C2</b>	<b>c1.</b> Recommend patients to use appropriate OTC medications and to correctly administer their medications
10.		<b>c2.</b> Dispense medications correctly and efficiently using standard procedures/
11.		<b>c3.</b> Administer pharmacy effectively and arrange medications in the pharmacy efficiently.
12.	<b>C4</b>	<b>c4 .</b> Search efficiently for information using documented and electronic sources of information.
13.		<b>c5.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	<b>D1</b>	<b>d1.</b> Share successfully in team-work.
15.	<b>D2</b>	<b>d2.</b> Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.



16.	D3	d3. Communicate effectively with his/her colleagues and patients.
17.	D4	d4. Demonstrate the ability of time management and self-learning.

4. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
a3, a4	Lecture	Written exam , Attendance
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	Lecture , laboratory practice, feed-back learning	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), quizzes
(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2, c3,	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), assignments
c4	feed-back learning, Group-project	Assignments
c5	laboratory practice, feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), assignments
(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:		



Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice , feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam), assignments
d2	Lecture	Written exam , Attendance



## V. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a4, b2, d2	<ul style="list-style-type: none"> <li>□ Filed of pharmacy practices, community pharmacy practice: objectives, requirements (pharmacist skills, knowledge, source of information: medical indexes "BNF", personal elegance ).</li> <li>□ drug product specifications: generic name, strength, trade name, manufacturer, country, leaflet components, Services offered to patients in community pharmacies (in brief)</li> </ul>	1	2
2	<b>Skills and knowledge of Dispensing medication</b>	a2, a4, c2, d2	<ul style="list-style-type: none"> <li>□ Items (details) of medical prescription</li> <li>□ Skills of dispensing : Standard Operating procedures (SOPs) of preparing a prescription: : careful reading, identifying the items of the prescription, checking of legality, making necessary calculation, checking, bringing medication, second checking, packaging, giving necessary instructions, answering patient`s questions</li> <li>□ Case studies and training on the SOPs of dispensing: examples of written prescriptions</li> </ul>	1	2
3	<b>Specific requirements for dispensing of controlled medications</b>	a2, a4, c2, d2	<ul style="list-style-type: none"> <li>□ Types of medications : Prescription Only medications (POMs) risks and need of awareness !</li> <li>□ Types of controlled drugs</li> <li>□ Regulations for prescription: legal prescribers, legally signed</li> <li>□ Prescription forms</li> <li>□ Addict (installment) prescriptions for controlled drugs</li> <li>□ Requisitions forms</li> <li>□ Record-keeping on a register ( example of a register form)</li> </ul>	1	2



			<input type="checkbox"/> Case study: training on controlled drug prescriptions		
4	<b>Recommending of OTC medications in response to symptoms</b>	a2, , b1, a4, b2, b3, b4, c1, d2	<input type="checkbox"/> Types of medications (OTC) dispensed without a prescription. <input type="checkbox"/> Factors to be considered when responding to symptoms in the pharmacy. <input type="checkbox"/> Observation of patient`s symptoms <input type="checkbox"/> Making a differential diagnosis <input type="checkbox"/> acronyms (SIT, ASMETHOD, ENCORE )used when responding to symptoms in a pharmacy <input type="checkbox"/> Taking a case history <input type="checkbox"/> Case study examples <input type="checkbox"/> OTC products for alimentary and respiratory disorders	5	10
<b>MID-TERM EXAM</b>				1	2
5	<b>Preparation and dispensing of extemporaneous products</b>	a2, a4, d2	<input type="checkbox"/> Types of extemporaneous preparations: from raw materials, from dosage forms (e.g. preparations of oral liquids from capsules, tablets and injectons) <input type="checkbox"/> Requirements of pharmaceutical lab. In the pharmacy <input type="checkbox"/> Information references e.g. British pharmacopeia <input type="checkbox"/> Challenge and troubles: Ingredients quality, stability, quality control testing <input type="checkbox"/> Packaging of extemporaneous preparations	2	4
6	<b>Patient`s counseling</b>	a4, b3, b4, c1, d2, d3, d2	<input type="checkbox"/> Skills for patients counseling: communication with the patient <input type="checkbox"/> Products-specific counseling points: explaining to the patient how to use (apply and take dose) of the following products correctly and what precautions should he/she avoid <input type="checkbox"/> Ophthalmic preparations: eye drops and ointments. <input type="checkbox"/> Nasal drops and sprays <input type="checkbox"/> Inhalers <input type="checkbox"/> Oral products: tablets, capsules,	1	2





			liquids, powders/granules <input type="checkbox"/> Suppositories, pessaries an vaginal creams <input type="checkbox"/> Topical dermatological preparations		
7	<b>Pharmacy administration</b>	a4, d2	<input type="checkbox"/> Documentation, indexing <input type="checkbox"/> Pricing, procurement, selling <input type="checkbox"/> Stock control <input type="checkbox"/> Storage areas I community pharmacy	2	4
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2, c3, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	7 Units



<b>B - Practical Aspect: The practical sections are carried out in the " Virtual pharmacy Lab"</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	Drug product specification	2	4	a1, a4, b2, c5, d1, d2, d3, , d4, d5
2.	Arrangement of medication in community pharmacy	2	4	a4, c3, c5, d1, d2, d3, , d4, d5
3.	OTC medications	2	4	a2, a4, b1, b2, d1, d2, d3, , d4, d5
4.	Prescription only medications and controlled drugs.	1	2	a4, b2, c5, d1, d2, d3, , d4, d5
5.	Skills of dispensing	1	2	a3, a4, c2, c5, d1, d2, d3, , d4, d5
6.	Patient`s counseling	2	4	a4, b3, b4, c1, d1, d2, d3, , d4, d5
7.	Pharmacy administration skills	1	2	c3, c5, d1, d2, d3, , d4, d5
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on a type of OTC medications	c4, c5, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a booklet of drug index of the a commercial drug products s of 1-2 drug categories.	c4, c5, d1, d3, d5	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2, c3, d2
2	Assignments (1 + 2)	4, 14	5	5	c4, c5, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b2, b4
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a4, b1, b2, b3, b4, c1, c2, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, c1, c2, c3, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, a4, b1, b2, b3, c1, c2, c3, c5, d1, d2, d3, , d4, d5
2	Lab. Attitude	weekly	2.5	2.5	c6, d1, d3, d4
3	Lab. Accomplishments	weekly	2.5	2.5	a1, a2, a4, b1, b2, b3, c1, c2, c3, c5
4	Lab. Reporting	weekly	5	5	c5
5	Exam of practice theory (written exam or oral exam)	14	5	5	a1, a2, a4, b1, b2, b3, c1, c2, c3, c5
6	Practical exam (practical)	14	20	20	a1, a2, a4, b1, b2, b3, c1, c2, c3, c5
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Lillian M Azzopardi. Lecture notes on pharmacy practice, 2010, Pharmaceutical press.Christopher
2. A Langley, Dawn Belcher. Applied pharmaceutical skills, 2009, Pharmaceutical press.

### 2- Essential References.

1. Agarwal. Dispensing and community pharmacy
2. Jain. A text book of professional pharmacy

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecturewill not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the examwill not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACEUTICAL BIOTECHNOLOGY

<b>I. Course Identification and General Information:</b>					
1.	Course Title:	PHARMACEUTICAL BIOTECHNOLOGY			
2.	Course Code & Number:				
3.	Credit hours:	C.H			TOTAL
		Theoretical		P.	
		L.	Tut.	S.	
		2	-	-	2
4.	Study level/ semester at which this course is offered:	( FOURTH ) Year – ( SECOND ) semester			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Pharmaceutics I, II , III&amp; IV</li> <li>General biology</li> <li>Pharmaceutical microbiology I</li> </ul>			
6.	Co –requisite (if any):				
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10.	Prepared By:				
11.	Date of Approval	2015			

<b>II. Course Description:</b>
The course deals with the study of principles & techniques of advance biotechnology and the drugs produced by those techniques.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the various types and characteristics of living organisms used to produce biotechnology drugs.
2.	A2	a2. Determine the physical, chemical and pharmacological properties of biotechnology-produced drugs.
3.	A3	a3. Define biotechnology and recognize its main purposes and techniques.
4.		a4. Explicit the pharmaceutical applications of biotechnology.
5.	A4	a5. Comprehend his/her role as a pharmacist in developing and employing biotechnology techniques in pharmacy practice.
6.	B1	b1. Interpret symbols and abbreviations related to biotechnology.
7.	B2	b2. Classify biotechnology techniques and drugs.
8.		b3. Compare between classical drugs & biotechnology-produced drugs and also between various types of biotechnology techniques.
9.	B4	b4. Assess the advantages and disadvantages of biotechnology-produced drugs.
10.		b5. Select appropriate biotechnology techniques to produce drugs.
11.	C4	c1. Search efficiently for information using documented and electronic sources of information.
12.		c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. Share successfully in team-work.
14.	D2	d2. Show respect to life and commit to community and patients serving.
15.	D3	d3. Communicate effectively with his/her colleagues.
16.	D4	d4. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a6, a3, a4, a5	Lecture	Written exam, Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b1, b3, b4, b5	Lecture, Feed-back learning	Written exam, Attendance, Assignments, quizzes

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam, Attendance
d4	Feed-back learning	Assignments





## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to Biotechnology</b>	a1, a3, a5, b1, d2	<ul style="list-style-type: none"> <li>definition &amp; purposes &amp; brief history.</li> <li>Relation of biotechnology to advancement in intracellular chemistry, molecular biology, rDNA technology, pharmacogenomics and immunopharmacology,</li> <li>living organisms used in biotechnology</li> <li>advantage and disadvantages of biotechnology drug products as compared to classical medications</li> </ul>	2	4
2	<b>Techniques of Biotechnology</b>	a4, a5, b1, b1, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>Classification of biotechnology techniques</li> <li>Principles, equipments, pharmaceutical applications, comparison, advantages and disadvantages of : <ul style="list-style-type: none"> <li>recombinant DNA (rDNA).</li> <li>Monoclonal antibodies</li> <li>Polymerase chain Reaction (PCR)</li> <li>Nucleotide blockade/antisense</li> <li>Peptide technology</li> </ul> </li> </ul>	4	8
<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>				1	2
3	<b>biotechnology produced- Drugs</b>	a2, a4, a5, b1, b3, b4, d2	<ul style="list-style-type: none"> <li>Classification of biotechnology drugs</li> <li>Proteins as the first biotechnology products of biotechnology</li> <li>Physicochemical properties, Indication, mechanism of action, dose, route of administration, precautions, biotechnology by which is obtained for the following products, :</li> </ul>	7	14



			<ul style="list-style-type: none"><li>○ Anticoagulant drug: Lepirudin (Refludan) ®</li><li>○ Antisense drugs : Fomivirsen sodium (Vitravene), efavirenz (Sustiva)®</li><li>○ Clotting factors : Systemic antihemophilic factors (Kogenate) ®</li><li>○ colony-stimulating factors: granulocyte colony–stimulating factor (Filgrastim)®</li><li>○ Erythropoietins : Epoetinalfa (Epogen, Procrit) ®</li><li>○ Fusion inhibitors: Enfuvirtide (Fuzeon) ®</li><li>○ Growth factor: becaplermin (Regranex) ®</li><li>○ Human growth hormone: ystemic growth hormone (Humatrope, protropin) ®</li><li>○ Interferons: interferon beta-1b (betaseron), interferon beta-1a (Avonex) ®</li><li>○ Interleukins: Aldesleukin (Proleukin) ®</li><li>○ tissue plasminogen activators: recombinant Alteplase (Activase) ®</li><li>○ Vaccines: hepatitis B vaccine recombinant (Engerix-b) ®, haemophilus B conjugate vaccine (Hibtiter) ®</li></ul>		
Course Review	a1, a2, a3, a4, a5, b1, b1, b3, b4, b5 , d2	Review of the course topics by discussion session.	1	2	
FINAL - EXAM			1	2	
TOTAL			16	32	
Number of Weeks /and Units Per Semester			16 weeks	3 Units	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one drug produced by biotechnology.	a2, d4	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on one recent advances in one biotechnology techniques	a3, d1, d3, d4	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b1, b3, b4, b5
2	Assignments (1 + 2)	4, 14	10	10	b4, c1, c2, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b5
4	Mid-semester exam of theoretical part (written exam)	7	20	20	a1, , a3, a4, a5, b1, b1, b3, b4, b5, d2
5	Final exam of theoretical part (written exam)	17	60	60	a1, a2, a3, a4, a2, a6, a3, a4, a5, b1, b2, b1, b4, b1, b3, b7, b8, b9, b9, b4, b5, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA: Chapter: Biotechnolohy

### 2- Essential References.

2. Nagori. Foundation s in pharmaceutical biotechnology
3. R.S. pharmaceutical biotechnology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

## PHARMACEUTICAL BIOTECHNOLOGY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of principles & techniques of advance biotechnology and the drugs produced by those techniques.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the various types and characteristics of living organisms used to produce biotechnology drugs.
2.	A2	a2. Determine the physical, chemical and pharmacological properties of biotechnology-produced drugs.
3.	A3	a3. Define biotechnology and recognize its main purposes and techniques.
4.		a4. Explicit the pharmaceutical applications of biotechnology.
5.	A4	a5. Comprehend his/her role as a pharmacist in developing and employing biotechnology techniques in pharmacy practice.
6.	B1	b1. Interpret symbols and abbreviations related to biotechnology.
7.	B2	b2. Classify biotechnology techniques and drugs.
8.		b3. Compare between classical drugs & biotechnology-produced drugs and also between various types of biotechnology techniques.
9.	B4	b4. Assess the advantages and disadvantages of biotechnology-produced drugs.
10.		b5. Select appropriate biotechnology techniques to produce drugs.
11.	C4	c1. Search efficiently for information using documented and electronic sources of information.
12.		c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. Share successfully in team-work.
14.	D2	d2. Show respect to life and commit to community and patients serving.
15.	D3	d3. Communicate effectively with his/her colleagues.
16.	D4	d4. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a6, a3, a4, a5	Lecture	Written exam, Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b1, b3, b4, b5	Lecture, Feed-back learning	Written exam, Attendance, Assignments, quizzes

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2	feed-back learning, Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam, Attendance
d4	Feed-back learning	Assignments





## V. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to Biotechnology</b>	a1, a3, a5, b1, d2	<ul style="list-style-type: none"> <li>definition &amp; purposes &amp; brief history.</li> <li>Relation of biotechnology to advancement in intracellular chemistry, molecular biology, rDNA technology, pharmacogenomics and immunopharmacology,</li> <li>living organisms used in biotechnology</li> <li>advantage and disadvantages of biotechnology drug products as compared to classical medications</li> </ul>	2	4
2	<b>Techniques of Biotechnology</b>	a4, a5, b1, b1, b3, b4, b5, d2	<ul style="list-style-type: none"> <li>Classification of biotechnology techniques</li> <li>Principles, equipments, pharmaceutical applications, comparison, advantages and disadvantages of : <ul style="list-style-type: none"> <li>recombinant DNA (rDNA).</li> <li>Monoclonal antibodies</li> <li>Polymerase chain Reaction (PCR)</li> <li>Nucleotide blockade/antisense</li> <li>Peptide technology</li> </ul> </li> </ul>	4	8
<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>				1	2
3	<b>biotechnology produced-Drugs</b>	a2, a4, a5, b1, b3, b4, d2	<ul style="list-style-type: none"> <li>Classification of biotechnology drugs</li> <li>Proteins as the first biotechnology products of biotechnology</li> <li>Physicochemical properties, Indication, mechanism of action, dose, route of administration, precautions, biotechnology by which is obtained for the following products, :</li> </ul>	7	14



			<ul style="list-style-type: none"><li>○ Anticoagulant drug: Lepirudin (Refludan) ®</li><li>○ Antisense drugs : Fomivirsen sodium (Vitravene), efavirenz (Sustiva)®</li><li>○ Clotting factors : Systemic antihemophilic factors (Kogenate) ®</li><li>○ colony-stimulating factors: granulocyte colony–stimulating factor (Filgrastim)®</li><li>○ Erythropoietins : Epoetinalfa (Epogen, Procrit) ®</li><li>○ Fusion inhibitors: Enfuvirtide (Fuzeon) ®</li><li>○ Growth factor: becaplermin (Regranex) ®</li><li>○ Human growth hormone: ystemic growth hormone (Humatrope, protropin) ®</li><li>○ Interferons: interferon beta-1b (betaseron), interferon beta-1a (Avonex) ®</li><li>○ Interleukins: Aldesleukin (Proleukin) ®</li><li>○ tissue plasminogen activators: recombinant Alteplase (Activase) ®</li><li>○ Vaccines: hepatitis B vaccine recombinant (Engerix-b) ®, haemophilus B conjugate vaccine (Hibtiter) ®</li></ul>		
Course Review	a1, a2, a3, a4, a5, b1, b1, b3, b4, b5 , d2	Review of the course topics by discussion session.	1	2	
FINAL - EXAM			1	2	
TOTAL			16	32	
Number of Weeks /and Units Per Semester			16 weeks	3 Units	



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on one drug produced by biotechnology.	a2, d4	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on one recent advances in one biotechnology techniques	a3, d1, d3, d4	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b1, b3, b4, b5
2	Assignments (1 + 2)	4, 14	10	10	b4, c1, c2, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b5
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, , a3, a4, a5, b1, b1, b3, b4, b5, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a2, a6, a3, a4, a5, b1, b2, b1, b4, b1, b3, b7, b8, b9, b9, b4, b5, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA: Chapter: Biotechnolohy

### 2- Essential References.

1. Nagori. Foundation s in pharmaceutical biotechnology
2. R.S. pharmaceutical biotechnology

### 3- Electronic Materials and Web Sites etc.

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## IX.Course Policies:

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4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### Pharmaceutical business administration

I.		Course Identification and General Information:				
1.	Course Title:	Pharmaceutical business administration				
2.	Course Code &Number:					
3.	Credit hours:	C.H				TOTAL
		Theoretical		P.	Tr.	
		L.	Tut.			
		2	-	-	-	
4.	Study level/ semester at which this course is offered:	( FOURTH) Year – ( 1 <sup>ST</sup> ) semester				
5.	Pre –requisite (if any):	BIOSTATSTICS				
6.	Co –requisite (if any):	NONE				
7.	Program (s) in which the course is offered:	All BC programs offered by the university				
8.	Language of teaching the course:	ENGLISH				
9.	Location of teaching the course:	IN THE UNIVERSITY				
10.	Prepared By:					
11.	Date of Approval	2015				

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals study of the study of measuring and comparing the costs of therapies and medical care services individually or in healthcare facilities and determining which alternative produces the best health outcome for the available budget .



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Discuss the basic pharmacoeconomic principles and analytical methods commonly used during his/her practicing the profession.
2.		a2. Define pharmacoeconomic, cost, effectiveness, benefit, perspectives and comprehend the main pharmacoeconomic objectives.
3.	B1	b1. Interpret the outcomes of pharmacoeconomic analysis.
4.	B2	b2. Solve pharmacoeconomic related problems.
5.	B3	b3. Compare between various types of outcomes and between different methods of pharmacoeconomic analysis.
6.	B4	b4. Use the serial thinking to find the solution of pharmacoeconomic problems.
7.	C1	c1. Operate and use scientific calculator correctly.
8.	C2	c2. Apply equations and rules to solve pharmacoeconomic problems
9.	D1	d1. Work successfully in team-work.
10.	D4	d2. Demonstrate the ability of time management, self-learning and problem solving

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture-discussion,, feed-back learning,	written exam

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	feed-back learning, Group-project.	Written exam
b2	Lecture-discussion, feed-back learning	written exam, quizzes,



		assignment
b3, b4	Lecture-discussion	written exam , quiz
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
c1	Lecture-discussion	Written exam
c2	Feed-back learning	Written exam
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	Teaching strategies	Assessment Strategies
d1	Lecture-discussion	Assignment
d2	Lecture-discussion	Quiz





## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a2	<ul style="list-style-type: none"> <li>definition of (economy, pharmacoeconomic, cost, effectiveness, benefit)</li> <li>history , significance and objectives of Pharmacoeconomics</li> <li>relation between Pharmacoeconomics and pharmaceutical care</li> </ul>	2	4
2	<b>Cost &amp; Perspectives</b>	a2, b1, b2, b4, c1, d2	<ul style="list-style-type: none"> <li>Types of costs : apparent cost, true cost, present cost, future cost with solving problems</li> <li>Types of perspective (patient perspective, payer perspective, Societal perspective)</li> </ul>	2	4
3	<b>Outcomes of medical therapies</b>	b1, b3	<ul style="list-style-type: none"> <li>Types of outcomes : Economic outcomes. Clinical outcomes, humanistic outcomes.</li> <li>Expression of outcomes: effectiveness, benefit, utility (Quality of life), etc</li> </ul>	2	4
	<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> </ul>			1	2
4	<b>Steps and types of pharmacoeconomic analysis</b>	a1, b1, b2, b3, b4, c1	<ul style="list-style-type: none"> <li>Define objectives</li> <li>Determine perspective</li> <li>Select analysis method <ul style="list-style-type: none"> <li>COI (cost of illness)</li> <li>CEA (cost-effectiveness analysis)</li> <li>CBA( cost-benefit analysis)</li> <li>CUA( cost-utility</li> </ul> </li> </ul>	7	14



		analysis) with solving problems for each type		
			1	2
Course Review	a1, a2, b1, b2,b3 b4, c1	Review of the course topics by discussion session.	1	2
FINAL - EXAM			1	2
TOTAL			16	32
Number of Weeks /and Units Per Semester			16 weeks	4 Units

## V. Teaching strategies of the course:

**lecture - Discussion:** a short lecture/ address followed by discussion

**Seminars:** these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve pharmacoeconomic problems during Tutorial at the class .	b2, b3, b4, c1, d2	4-13	6
2	<b>Group :</b> each group of students will be assigned to solve pharmacoeconomic problems during as homework	b2, b3, b4, c1, d1	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, b1, b2,b3 b4, c1
2	Assignments (1 + 2)	4-13, 14	10	10	b2,b3, b4, c1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, b1, b2,b3 b4, c1
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, b1, b2,b3 b4, c1
TOTAL			100	100 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Brian L. Strom. Textbook of pharmacoepidemiology. Chapter 22: Pharmacoeconomics: Economic Evaluation of Pharmaceuticals, 2006, John Wiley & Sons Ltd

### 2- Essential References.

1. Diprio Pharmacotherapy pathophysiologic approaches : Pharmacoeconomics, 2010

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of PHARMACOECONOMICS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals study of the study of measuring and comparing the costs of therapies and medical care services individually or in healthcare facilities and determining which alternative produces the best health outcome for the available budget .



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Discuss the basic pharmacoeconomic principles and analytical methods commonly used during his/her practicing the profession.
2.		a2. Define pharmacoeconomic, cost, effectiveness, benefit, perspectives and comprehend the main pharmacoeconomic objectives.
3.	B1	b1. Interpret the outcomes of pharmacoeconomic analysis.
4.	B2	b2. Solve pharmacoeconomic related problems.
5.	B3	b3. Compare between various types of outcomes and between different methods of pharmacoeconomic analysis.
6.	B4	b4. Use the serial thinking to find the solution of pharmacoeconomic problems.
7.	C1	c1. Operate and use scientific calculator correctly.
8.	C2	c2. Apply equations and rules to solve pharmacoeconomic problems
9.	D1	d1. Work successfully in team-work.
10.	D4	d2. Demonstrate the ability of time management, self-learning and problem solving

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture-discussion,, feed-back learning,	written exam

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
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<b>b1</b>	<b>feed-back learning, Group-project.</b>	<b>Written exam</b>
<b>b2</b>	<b>Lecture-discussion , feed-back learning</b>	<b>written exam , quizzes, assignment</b>
<b>b3, b4</b>	<b>Lecture-discussion</b>	<b>written exam , quiz</b>
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1</b>	<b>Lecture-discussion</b>	<b>Written exam</b>
<b>c2</b>	<b>Feed-back learning</b>	<b>Written exam</b>
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1</b>	<b>Lecture-discussion</b>	<b>Assignment</b>
<b>d2</b>	<b>Lecture-discussion</b>	<b>Quiz</b>



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a2	<ul style="list-style-type: none"> <li>definition of (economy, pharmacoeconomic, cost, effectiveness, benefit)</li> <li>history , significance and objectives of Pharmacoeconomics</li> <li>relation between Pharmacoeconomics and pharmaceutical care</li> </ul>	2	4
2	<b>Cost &amp; Perspectives</b>	a2, b1, b2, b4, c1, d2	<ul style="list-style-type: none"> <li>Types of costs : apparent cost, true cost, present cost, future cost with solving problems</li> <li>Types of perspective (patient perspective, payer perspective, Societal perspective)</li> </ul>	2	4
3	<b>Outcomes of medical therapies</b>	b1, b3	<ul style="list-style-type: none"> <li>Types of outcomes : Economic outcomes. Clinical outcomes, humanistic outcomes.</li> <li>Expression of outcomes: effectiveness, benefit, utility (Quality of life), etc</li> </ul>	2	4
	<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> </ul>			1	2
4	<b>Steps and types of pharmacoeconomic analysis</b>	a1, b1, b2, b3, b4, c1	<ul style="list-style-type: none"> <li>Define objectives</li> <li>Determine perspective</li> <li>Select analysis method <ul style="list-style-type: none"> <li>COI (cost of illness)</li> <li>CEA (cost-effectiveness analysis)</li> <li>CBA( cost-benefit analysis)</li> <li>CUA( cost-utility analysis)</li> </ul> </li> <li>with solving problems for each type</li> </ul>	7	14





			1	2
<b>Course Review</b>	a1, a2, b1, b2,b3 b4, c1	Review of the course topics by discussion session.	1	2
FINAL - EXAM			1	2
TOTAL			16	32
Number of Weeks /and Units Per Semester			16 weeks	4 Units

## V. Teaching strategies of the course:

**lecture - Discussion:** a short lecture/ address followed by discussion

**Seminars:** these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve pharmacoeconomic problems during Tutorial at the class .	b2, b3, b4, c1, d2	4-13	6
2	<b>Group :</b> each group of students will be assigned to solve pharmacoeconomic problems during as homework	b2, b3, b4, c1, d1	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, b1, b2, b3 b4, c1
2	Assignments (1 + 2)	4-13, 14	10	10	b2, b3, b4, c1, d2
3	Quiz 1 + Quiz 2	7, 12	5	5	b1, b2
4	Mid-semester exam of theoretical part (written exam)	7	20	20	a1, a2, b1, b2, b3 b4, c1
5	Final exam of theoretical part (written exam)	17	60	60	a1, a2, b1, b2, b3 b4, c1
TOTAL			100	100 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Brian L. Strom. Textbook of pharmacoepidemiology. Chapter 22: Pharmacoeconomics: Economic Evaluation of Pharmaceuticals, 2006, John Wiley & Sons Ltd

### 2- Essential References.

1. Diprio Pharmacotherapy pathophysiologic approaches : Pharmacoeconomics, 2010

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACOLOGY I

I. Course Identification and General Information:							
1.	Course Title:	PHARMACOLOGY I					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( FOURTH ) Year – (1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"><li>• Physiology I, II</li><li>• Pathology</li></ul>					
6.	Co –requisite (if any):	<ul style="list-style-type: none"><li>• Medicinal chemistry I</li></ul>					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course provides the students with knowledge of mechanisms of drugs on the body including drug-receptors interaction and effect of body on drugs. The course also deals with the study of pharmacodynamic and pharmacokinetics of drugs affecting autonomic nervous system and skeletal muscles.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the various types of pharmacokinetics, mechanisms of action (MAO) , adverse effects , doses (effective, lethal ) , therapeutic index and drug interactions of drugs.
2.		a2. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug posology of drugs affecting autonomic nervous system, skeletal muscles.
3.		a3. Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of drugs affecting autonomic nervous system, skeletal muscles.
4.	A4	a4. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
5.	B2	b1 .Classify drugs used for disorders of drugs affecting autonomic nervous system, skeletal muscles and drugs used for eye and alimentary system disorders.
6.		b2. Compare between therapeutically related drugs based on drug benefits ( in particular efficacy and potency)and drug limitations.
7.	B3	b3. Relate drug indications to MAO of drugs.
8.		b4. Predict drug limitations on the basis of Drug MOA.
9.	B4	b5. Select an appropriate drug for patients based on drug benefits and limitation.
10.	C1	c1. Provide correct information on drug benefits and limitation.
11.	C2	c2 .Search efficiently for information using documented and electronic sources of information.
12.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. Share successfully in team-work.
14.	D2	d2. Show respect to life.
15.	D4	d3. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture	Written exam , Attendance
a4	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3	Lecture	Written exam , Attendance, quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture, feed-back learning	written exam, attendance, assignment
c2	feed-back learning, Group-project	Assignments
c3	laboratory practice	Practical assessment (Lab. attendance, reporting, practical exam)
c3	Feed-back learning Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d3	Feed-back learning	Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to pharmacology ( General pharmacology)</b>	a1, a4, b2, b3, b4, b5, c1, d2	<ul style="list-style-type: none"> <li>• Definition, brief history</li> <li>• Divisions of pharmacology (pharmacokinetics, pharmacodynamics : definitions, field of concern)</li> <li>• Dose-Response curve</li> <li>• Types of dose (effective, lethal), therapeutic index</li> <li>• Drug efficacy and drug potency</li> <li>• Mechanisms of drug action : drug targets (receptors, enzymes, ion channels, etc).</li> <li>• receptor theory , types of receptors, affinity, specificity, selectivity, agonist, antagonist, competitive and non-competitive , reversible and irreversible.</li> <li>• Enzymes as drug targets : types, examples, mechanisms</li> <li>• Ion channels as drug target : types, examples, mechanisms</li> <li>• Neurotransmitters and autacoids: physiopathologic roles</li> <li>• Types of drug adverse effects with examples</li> <li>• Types of drug interactions effects with examples</li> <li>• Pharmacokinetics ( in brief) : drug absorption, distribution, metabolism, excretion</li> </ul>	4	8



2	Drugs acting on the autonomies nervous system	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics</b> <b>[ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>Indirectly sympathomimetics</li> <li>Direct symapthomimetics: adrenergic agonists</li> <li>Indirectly sympatholytic drugs</li> <li>Directly sympatholytic drugs : adrenergic blocking agents</li> </ul>	4	8
	MIDTERM EXAM			1	2
	Drugs acting on the autonomies nervous system	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics</b> <b>[ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>Indirectly parasympathomimetics</li> <li>Direct parasympathomimetics : cholinergic agonists</li> <li>Indirectly parasympatholytic drugs</li> <li>Directly sympatholytic drugs : cholinergic blocking agents</li> <li><b>Drugs affecting autonomic ganglia:</b> ganglia stimulants , ganglia blockers</li> </ul>	3	6
3	Drugs affecting skeletal muscles	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics</b> <b>[ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>Neuromuscular blocking agents</li> <li>Central muscles relaxants</li> </ul>	2	6
Course Review		a2, a3, a4, b1,	Review of the course topics by discussion session.	1	2





	b2, b3, b4, b5, c1, d2			
FINAL - EXAM			1	2
TOTAL			16	32
Number of Weeks /and Units Per Semester			16 weeks	3 Units

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to prepare an index booklet of the drugs studied in the course. The index should contain the basic drug information on drug benefits and limitation.	c2, c3, d3	13	6
2	<b>Group</b> : each group of students will be assigned to provide a comparison chart on drugs of the same pharmacologic category. Comparison focuses on drug benefits and limitations.	b2, c2, c3, d1, d3	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, c2, c3, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a4, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Katzung –Basic and Clinical Pharmacology, (2007), McGraw-Hill
2. Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.

### 2- Essential References.

1. Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins.
2. Udaykumar. Text book of medical pharmacology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
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5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### PHARMACOLOGY & THERAPEUTICS I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course provides the students with knowledge of mechanisms of drugs on the body including drug-receptors interaction and effect of body on drugs. The course also deals with the study of pharmacodynamic and pharmacokinetics of drugs affecting autonomic nervous system and skeletal muscles.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explicit the various types of pharmacokinetics, mechanisms of action (MAO) , adverse effects , doses (effective, lethal ) , therapeutic index and drug interactions of drugs.
2.		a2. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug posology of drugs affecting autonomic nervous system, skeletal muscles.
3.		a3. Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of drugs affecting autonomic nervous system, skeletal muscles.
4.	A4	a4. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
5.	B2	b1 .Classify drugs used for disorders of drugs affecting autonomic nervous system, skeletal muscles and drugs used for eye and alimentary system disorders.
6.		b2. Compare between therapeutically related drugs based on drug benefits ( in particular efficacy and potency)and drug limitations.
7.	B3	b3. Relate drug indications to MAO of drugs.
8.		b4. Predict drug limitations on the basis of Drug MOA.
9.	B4	b5. Select an appropriate drug for patients based on drug benefits and limitation.
10.	C1	c1. Provide correct information on drug benefits and limitation.
11.	C2	c2 .Search efficiently for information using documented and electronic sources of information.
12.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
13.	D1	d1. Share successfully in team-work.
14.	D2	d2. Show respect to life.
15.	D4	d3. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3	Lecture	Written exam , Attendance
a4	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3	Lecture	Written exam , Attendance, quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture, feed-back learning	written exam, attendance, assignment
c2	feed-back learning, Group-project	Assignments
c3	laboratory practice	Practical assessment (Lab. attendance, reporting, practical exam)
c3	Feed-back learning Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d3	Feed-back learning	Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to pharmacology ( General pharmacology)</b>	a1, a4, b2, b3, b4, b5, c1, d2	<ul style="list-style-type: none"> <li>• Definition, brief history</li> <li>• Divisions of pharmacology (pharmacokinetics, pharmacodynamics : definitions, field of concern)</li> <li>• Dose-Response curve</li> <li>• Types of dose (effective, lethal), therapeutic index</li> <li>• Drug efficacy and drug potency</li> <li>• Mechanisms of drug action : drug targets (receptors, enzymes, ion channels, etc).</li> <li>• receptor theory , types of receptors, affinity, specificity, selectivity, agonist, antagonist, competitive and non-competitive , reversible and irreversible.</li> <li>• Enzymes as drug targets : types, examples, mechanisms</li> <li>• Ion channels as drug target : types, examples, mechanisms</li> <li>• Neurotransmitters and autacoids: physiopathologic roles</li> <li>• Types of drug adverse effects with examples</li> <li>• Types of drug interactions effects with examples</li> <li>• Pharmacokinetics ( in brief) : drug absorption, distribution, metabolism, excretion</li> </ul>	4	8



2	Drugs acting on the autonomies nervous system	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics</b> <b>[ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>Indirectly sympathomimetics</li> <li>Direct symapthomimetics: adrenergic agonists</li> <li>Indirectly sympatholytic drugs</li> <li>Directly sympatholytic drugs : adrenergic blocking agents</li> </ul>	4	8
	<b>MIDTERM EXAM</b>			1	2
	Drugs acting on the autonomies nervous system	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics</b> <b>[ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>Indirectly parasympathomimetics</li> <li>Direct parasympathomimetics : cholinergic agonists</li> <li>Indirectly parasympatholytic drugs</li> <li>Directly sympatholytic drugs : cholinergic blocking agents</li> <li><b>Drugs affecting autonomic ganglia:</b> ganglia stimulants , ganglia blockers</li> </ul>	3	6
3	Drugs affecting skeletal muscles	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics</b> <b>[ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>Neuromuscular blocking agents</li> <li>Central muscles relaxants</li> </ul>	2	6
<b>Course Review</b>		a2, a3, a4, b1,	Review of the course topics by discussion session.	1	2





	b2, b3, b4, b5, c1, d2			
FINAL - EXAM			1	2
TOTAL			16	32
Number of Weeks /and Units Per Semester			16 weeks	3 Units

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to prepare an index booklet of the drugs studied in the course. The index should contain the basic drug information on drug benefits and limitation.	c2, c3, d3	13	6
2	<b>Group</b> : each group of students will be assigned to provide a comparison chart on drugs of the same pharmacologic category. Comparison focuses on drug benefits and limitations.	b2, c2, c3, d1, d3	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, c2, c3, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a4, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a2, a3, a4, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Katzung –Basic and Clinical Pharmacology, (2007), McGraw-Hill
2. Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.

### 2- Essential References.

1. Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins.
2. Udaykumar. Text book of medical pharmacology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHYTOCHEMISTRY I

I. Course Identification and General Information:					
1.	Course Title:	PHYTOCHEMISTRY I			
2.	Course Code & Number:				
3.	Credit hours:	C.H			TOTAL
		Theoretical		P.	
		L.	Tut.	S.	
		2	-	-	3
4.	Study level/ semester at which this course is offered:	( FOURTH ) Year – ( 1ST ) semester			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>General Pharmacognosy I , II</li> </ul>			
6.	Co –requisite (if any):	none			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10.	Prepared By:				
11.	Date of Approval	2015			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of physicochemical properties, extraction, isolation and identification of active chemical constituents (phytochemicals) obtained from medicinal plants in particular alkaloids and terpenoids.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Determine the botanical source and therapeutic uses of alkaloids and terpenoidsphytochemicals.
2.	A2	a2. Determine the physicochemical properties of alkaloids and terpenoidsphytochemicals.
3.	A3	a3. Discuss the methods and techniques used to extract and isolate phytochemicals
4.	A4	a4. Comprehend his/her role as a pharmacist in extraction, isolation and identification of phytochemicals.
5.	B1	b1. Express the chemical structure of phytochemicalsusing drawings.
6.	B2	b2. Differentiate between various types of alkaloids and terpenoids.
7.		b3. Solve problems related to nomenclature, identification and differentiation of phytochemicals.
8.		b4 .Classifyalkaloids and terpenoids chemically and therapeutically
9.		b5. Compare between methods of extraction and isolation of phytochemicals based on their applications and efficiencies.
10.	B3	b6. Predict the outcomes of chemical reactions of alkaloids and terpenoids.
11.	B4	b7. Select the most appropriate technique for extraction and isolation of phytochemicals.
12.	C1	c1.Handleefficiently the tools and chemicals used in phytochemistry Lab.
13.		c2. Operate successfully the instruments used in phytochemistry Lab.
14.	C2	c3 . Perform effectively the experiments , practical tasks including extraction, identification and isolation of phytochemicals using standard procedures.
15.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
16.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
17.		c6. Present and report his/her works correctly using appropriate writing



		rules and technologies media.
18.	D1	d1. Share successfully in team-work.
19.	D2	d2. Show respect to life& Behave in discipline during practicing practical and professional works and assignments.
20.	D3	d3. Communicate effectively with his/her colleagues.
21.	D4	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture , feed-back learning laboratory practice	Written exam , Attendance, quizzes Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5	Lecture	Written exam , Attendance
b6	Lecture , feed-back learning	Written exam , Attendance,



		assignment, quizzes
<b>b7</b>	Lecture	Written exam , Attendance
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1, c2, c3, c4</b>	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
<b>c5</b>	feed-back learning, Group-project	Assignments
<b>c6</b>	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d3, d4</b>	laboratory practice	Practical assessment (Lab. attendance, attitude, practical exam)
	Feed-back learning	Assignments
<b>d2</b>	Lecture , laboratory practice	Written exam , Attendance , lab. attitude



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to phytochemistry</b>	a2, a4 , b1, d2	<input type="checkbox"/> Definition, brief history, types (conventional, medicinal) <input type="checkbox"/> Scope of medicinal phytochemistry <input type="checkbox"/> Phytochemicals : Definition , evolution process, clarification, chemical classification , physicochemical properties	1	2
2	<b>Extraction of phytochemicals</b>	a3, a4, b7, d2	<b>Extraction techniques</b> <input type="checkbox"/> Maceration, percolation, soxhlet extractor: principle, apparatus, applications <input type="checkbox"/> Spouted bed extraction <input type="checkbox"/> Superficial fluid extraction <input type="checkbox"/> Solid-phase microextraction	2	4
3	<b>Separation and isolation of phytochemicals</b>	a3, b5, b7, d2	<b>Theoretical principle and components , components interactions , types, instrumentation, factors affecting, output data, applications in quantitative/qualitative analysis of :</b> <ul style="list-style-type: none"> <li>• <b>Sublimation , Distillation , Fractional liberation , Fractional crystallization :</b> principle, apparatus, applications</li> <li>• <b>Solid-phase Extraction:</b> adsorbants, principle, apparatus, applications</li> <li>• <b>Chromatography</b> introduction and definitions, principle, brief history, types and selection of stationary phase and mobile phase, general factors affecting separation, adsorption chromatography, partition chromatography               <ul style="list-style-type: none"> <li>○ <b>simple chromatographic techniques:</b> principle , procedures (mobile, stationary phase, flow rate), illustrative examples and applications of</li> </ul> </li> </ul>	3	6





			<ul style="list-style-type: none"> <li>❖ Paper chromatography</li> <li>❖ Thin layer chromatography (TLC) and HPTLC</li> <li>❖ Column chromatography</li> <li>❖ Gel-filtration chromatography</li> </ul>		
MID-TERM EXAM				1	2
4	Alkaloids	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	<ul style="list-style-type: none"> <li>○ Introduction: definition, history, occurrence, classification, nomenclature, physical and chemical properties, isolation, purification and detection.</li> <li>○ Phenylalkylamine alkaloids (ephedrine, cathinone and capsaicinoids)</li> <li>○ Isoquinoline alkaloids (papaverine, morphine, codeine and emetine)</li> <li>○ Tropane alkaloids (colchicine and demecolcine)</li> <li>○ Amaryllidacean alkaloids (lycorine and galanthamine)</li> <li>○ Alkaloids derived from tryptophan</li> <li>○ Indole alkaloids (physostigmine, carboline, ergoline, ajmalicine, yohimbine, ajmaline and strychnine type)</li> <li>○ Chinoline alkaloids (cinchona alkaloids)</li> <li>○ Alkaloids derived from histidine: (pilocarpine, isopilocarpine and pilosine)</li> <li>○ Alkaloids derived from asparagic acid: (ricinine and nicotine alkaloids)</li> <li>○ Alkaloids derived from lysine piperidine alkaloids (piper, lobelia and pomegranate alkaloids)</li> <li>○ chinolizidine alkaloids (lupinine, sparteine and cytosine)</li> <li>○ Alkaloids derived from ornithine: tropane alkaloids (atropine, hyoscyamine, scopolamine and cocaine) chinazoline alkaloids (tetradoxine)</li> <li>○ Alkaloids derived from glycine: purine alkaloids (caffeine, theophylline and</li> </ul>	4	8



			theobromine)terpen alkaloids(monoterpen,sesquiterpen and diterpen alkaloids)		
5	<b>Terpenoids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	<ul style="list-style-type: none"> <li>○ Introduction (definition,classification,biosynthesis and distribution)</li> <li>○ Monoterpens (regular and irregular monoterpenoids,iridoids,structures,che mical and physical properties and drugs containing monoterpenoids)</li> <li>○ Sequiterpens and sequiterpens lactones(structures,chemical and biological properties and drug containing sequiterpens and sequiterpens lactones)</li> <li>○ Diterpenes( structures,chemical and biological properties and drug containing diterpenes)</li> <li>○ Triterpenes(classification,structures and drug containing triterpenes)</li> <li>○ Tetraterpenes(chemical and biological properties,vitamin A and drug containing tetraterpenes).</li> </ul>	3	6
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units



<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
physicochemical properties , extraction (maceration or percolation or soxhlet extraction ) , concentration (if necessary " rotary evaporation', isolation (Thin layer chromatography) and identification of the phytochemicals from crude drugs or parts of medicinal plants				
1.	alkaloids (Caffeine )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2.	alkaloids (Theophylline)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
3.	alkaloids (cathinone)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
4.	alkaloids ( <u>Trigonelline</u> )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
5.	alkaloids ( <u>vincristine</u> )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
6.	alkaloids (Capsaicin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
7.	Terpenoids : ( Prenol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
8.	Terpenoids : ( Eucalytol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
9.	Terpenoids : ( Retinol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
10.	Terpenoids : ( squalane)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
11.	Review		2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
PRACTICAL EXAM		1	2	
<b>Total</b>		12	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.</p> <p>The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : each student will be assigned solve the problems provided by the teacher. The problems involve nomenclature, isolation , chemical reaction, etc.	b3, b6., c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to present 2-3 videos or simulations of one of the studied extraction , isolation techniques.	c5, c6, d1, d3, d5	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2
2	Assignments (1 + 2)	4, 14	5	5	b3, b6, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b2, b3, b6
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a2, a3, a4 , b1, b5 b7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
6	Practical exam (practical)	14	20	20	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders
2. Amritpal Singh Saroya, Herbalism, Phytochemistry and Ethnopharmacology, 2011, CRC press Jarald.

### 2- Essential References.

3. Bhandari. Textbook of pharmacognosy

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of PHYTOCHEMISTRY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

## II. Course Description:

The course deals with the study of physicochemical properties, extraction, isolation and identification of active chemical constituents (phytochemicals) obtained from medicinal plants in particular alkaloids and terpenoids.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Determine the botanical source and therapeutic uses of alkaloids and terpenoidsphytochemicals.
2.	A2	a2. Determine the physicochemical properties of alkaloids and terpenoidsphytochemicals.
3.	A3	a3. Discuss the methods and techniques used to extract and isolate phytochemicals
4.	A4	a4. Comprehend his/her role as a pharmacist in extraction, isolation and identification of phytochemicals.
5.	B1	b1. Express the chemical structure of phytochemicalsusing drawings.
6.	B2	b2. Differentiate between various types of alkaloids and terpenoids.
7.		b3. Solve problems related to nomenclature, identification and differentiation of phytochemicals.
8.	B2	b4 .Classifyalkaloids and terpenoids chemically and therapeutically
9.		b5. Compare between methods of extraction and isolation of phytochemicals based on their applications and efficiencies.
10.	B3	b6. Predict the outcomes of chemical reactions of alkaloids and terpenoids.
11.	B4	b7. Select the most appropriate technique for extraction and isolation of phytochemicals.
12.	C1	c1.Handleefficiently the tools and chemicals used in phytochemistry Lab.
13.		c2. Operate successfully the instruments used in phytochemistry Lab.
14.	C2	c3 . Perform effectively the experiments , practical tasks including extraction, identification and isolation of phytochemicals using standard procedures.
15.	C3	c4 .Take the required safety criteria during performing different types of practical and professional pharmacy works.
16.	C4	c5 .Search efficiently for information using documented and electronic





		sources of information.
17.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
18.	D1	d1. Share successfully in team-work.
19.	D2	d2. Show respect to life& Behave in discipline during practicing practical and professional works and assignments.
20.	D3	d3. Communicate effectively with his/her colleagues.
21.	D4	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture , feed-back learning laboratory practice	Written exam , Attendance, quizzes Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes



<b>b4, b5</b>	Lecture	Written exam , Attendance
<b>b6</b>	Lecture , feed-back learning	Written exam , Attendance, assignment, quizzes
<b>b7</b>	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1, c2, c3, c4</b>	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
<b>c5</b>	feed-back learning, Group-project	Assignments
<b>c6</b>	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d3, d4</b>	laboratory practice	Practical assessment (Lab. attendance, attitude, practical exam)
	Feed-back learning	Assignments
<b>d2</b>	Lecture , laboratory practice	Written exam , Attendance , lab. attitude



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to phytochemistry</b>	a2, a4 , b1, d2	<input type="checkbox"/> Definition, brief history, types (conventional, medicinal) <input type="checkbox"/> Scope of medicinal phytochemistry <input type="checkbox"/> Phytochemicals : Definition , evolution process, clarification, chemical classification , physicochemical properties	1	2
2	<b>Extraction of phytochemicals</b>	a3, a4, b7, d2	<b>Extraction techniques</b> <input type="checkbox"/> Maceration, percolation, soxhlet extractor: principle, apparatus, applications <input type="checkbox"/> Spouted bed extraction <input type="checkbox"/> Superficial fluid extraction <input type="checkbox"/> Solid-phase microextraction	2	4
3	<b>Separation and isolation of phytochemicals</b>	a3, b5, b7, d2	<b>Theoretical principle and components , components interactions , types, instrumentation, factors affecting, output data, applications in quantitative/qualitative analysis of :</b> <ul style="list-style-type: none"> <li>• <b>Sublimation , Distillation , Fractional liberation , Fractional crystallization :</b> principle, apparatus, applications</li> <li>• <b>Solid-phase Extraction:</b> adsorbants, principle, apparatus, applications</li> <li>• <b>Chromatography</b> introduction and definitions, principle, brief history, types and selection of stationary phase and mobile phase, general factors affecting separation, adsorption chromatography, partition chromatography               <ul style="list-style-type: none"> <li>○ <b>simple chromatographic techniques:</b> principle , procedures (mobile, stationary phase, flow</li> </ul> </li> </ul>	3	6



			<p>rate), illustrative examples and applications of</p> <ul style="list-style-type: none"> <li>❖ Paper chromatography</li> <li>❖ Thin layer chromatography (TLC) and HPTLC</li> <li>❖ Column chromatography</li> <li>❖ Gel-filtration chromatography</li> </ul>		
MID-TERM EXAM				1	2
4	Alkaloids	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	<ul style="list-style-type: none"> <li>○ Introduction: definition, history, occurrence, classification, nomenclature, physical and chemical properties, isolation, purification and detection.</li> <li>○ Phenylalkylamine alkaloids (ephedrine, cathinone and capsaicinoids)</li> <li>○ Isoquinoline alkaloids (papaverine, morphine, codeine and emetine)</li> <li>○ Tropane alkaloids (colchicine and demecolcine)</li> <li>○ Amaryllidacean alkaloids (lycorine and galanthamine)</li> <li>○ Alkaloids derived from tryptophan</li> <li>○ Indole alkaloids (physostigmine, carboline, ergoline, ajmalicine, yohimbine, ajmaline and strychnine type)</li> <li>○ Chinoline alkaloids (cinchona alkaloids)</li> <li>○ Alkaloids derived from histidine: (pilocarpine, isopilocarpine and pilosine)</li> <li>○ Alkaloids derived from asparagic acid: (ricinine and nicotine alkaloids)</li> <li>○ Alkaloids derived from lysine</li> <li>○ piperidine alkaloids (piper, lobelia and pomegranate alkaloids)</li> <li>○ chinolizidine alkaloids (lupinine, sparteine and cytosine)</li> <li>○ Alkaloids derived from ornithine: tropane alkaloids (atropine, hyoscyamine, scopolamine and cocaine) chinazoline alkaloids (tetradoxine)</li> </ul>	4	8



			<ul style="list-style-type: none"> <li>Alkaloids derived from glycine:purine alkaloids (caffeine,theophylline and theobromine)terpen alkaloids(monoterpen,sesquiterpen and diterpen alkaloids)</li> </ul>		
5	<b>Terpenoids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	<ul style="list-style-type: none"> <li>Introduction (definition,classification,biosynthesis and distribution)</li> <li>Monoterpens (regular and irregular monoterpenoids,iridoids,structures,chemical and physical properties and drugs containing monoterpenoids)</li> <li>Sequiterpens and sequiterpens lactones(structures,chemical and biological properties and drug containing sequiterpens and sequiterpens lactones)</li> <li>Diterpenes( structures,chemical and biological properties and drug containing diterpenes)</li> <li>Triterpenes(classification,structures and drug containing triterpenes)</li> <li>Tetraterpenes(chemical and biological properties,vitamin A and drug containing tetraterpenes).</li> </ul>	3	6
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units



<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOS
physicochemical properties , extraction (maceration or percolation or soxhlet extraction ) , concentration (if necessary " rotary evaporation', isolation (Thin layer chromatography) and identification of the phytochemicals from crude drugs or parts of medicinal plants				
1.	alkaloids (Caffeine )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2.	alkaloids (Theophylline)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
3.	alkaloids (cathinone)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
4.	alkaloids ( <u>Trigonelline</u> )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
5.	alkaloids ( <u>vincristine</u> )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
6.	alkaloids (Capsaicin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
7.	Terpenoids : ( Prenol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
8.	Terpenoids : ( Eucalytol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
9.	Terpenoids : ( Retinol)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
10.	Terpenoids : ( squalane)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
11.	Review		2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : each student will be assigned solve the problems provided by the teacher. The problems involve nomenclature, isolation , chemical reaction, etc.	b3, b6., c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to present 2-3 videos or simulations of one of the studied extraction , isolation techniques.	c5, c6, d1, d3, d5	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2
2	Assignments (1 + 2)	4, 14	5	5	b3, b6, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b2, b3, b6
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a2, a3, a4 , b1, b5 b7, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b6, b7, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
6	Practical exam (practical)	14	20	20	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
Total			40	40 %	





## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders</li> <li>2. Amritpal Singh Saroya, Herbalism, Phytochemistry and Ethnopharmacology, 2011, CRC press Jarald.</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>1. Bhandari. Textbook of pharmacognosy</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### Pharmaceutical business administration

I. Course Identification and General Information:							
1.	Course Title:	Pharmaceutical business administration					
2.	Course Code &Number:	YMP 4 153					
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-			-
4.	Study level/ semester at which this course is offered:	Forth year/ 1 <sup>st</sup> semester					
5.	Pre –requisite (if any):	Nil					
6.	Co –requisite (if any):	Nil					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	Faculty of medicinal science					
10	Prepared By:	Prof. Dr Jalal Hamoud Al-qadasi					
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course familiarizes the pharmacist to work effectively within a team in pharmaceutical organizations and how to effectively manage personnel and resources, how pharmaceutical organizations meet the challenges of today's dynamic business environment, and how companies compete successfully in the global market.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Describe the principles and concepts of personnel and resources management.
2.	A1	a2. Discuss strategies for managers to support the employees and a team in pharmaceutical organizations.
3.	B1	b1. Demonstrate personnel and resources management skills
4.	B2	b2. Analyze the business opportunities and identify purchasing, receiving, merchandising and marketing strategies that would be implemented to best suit each environment.
5.	C1	c1. Use effectively management principles in pharmacy practice
6.	C1	c2. Successfully implement all activities about the pharmacy operations
7.	D1	d1. Communicate effectively in a team.
8.	D2	d2. Develop financial, sales and market management skills.

#### 2. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge& understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Describe the principles and concepts of personnel and resources management.	Lecture	Theoretical exams
a2. Discuss strategies for managers to support the employees and a team in pharmaceutical organizations.	Demonstration Practicing Discussion Demonstration Lecture	Assignments Written exam ,

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
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b1. Demonstrate personnel and resources management skills	Lecture Demonstration Practicing Discussion Demonstration	Theoretical exams Practical Test Assignments
b2. Analyze the business opportunities and identify purchasing, receiving, merchandising and marketing strategies that would be implemented to best suit each environment.		
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1. Use effectively management principles in pharmacy practice	Lecture Demonstration Practicing Discussion	Theoretical exams Assignments
c2. Successfully implement all activities about the pharmacy operations		
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1. Communicate effectively in a team.	<ul style="list-style-type: none"> <li>Discussion Strategy</li> <li>Case Method</li> <li>Work group Assignments</li> </ul>	<ul style="list-style-type: none"> <li>Use email to deliver assignments.</li> </ul>
d2. Develop financial, sales and market management skills.		Using communication media by students (group working)



<b>V. Course Content:</b>					
<b>A – Theoretical Aspect:</b>					
Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact hours	Learning Outcomes
1	<b>Introduction</b>	<ul style="list-style-type: none"> <li>- The “Management” in Medication Therapy Management</li> <li>- Management Functions</li> <li>- Leadership in Pharmacy Practice</li> <li>- Ethical Decision-Making, Problem-Solving, and Delegating Authority</li> <li>- Creating and Managing Value</li> </ul>	2	4	All ILOs
2	<b>Operations Management</b>	<ul style="list-style-type: none"> <li>Strategic Planning in Pharmacy Operations</li> <li>- Business Planning for Pharmacy Programs</li> <li>- Operations Management</li> <li>- Managing Technology That Supports the Medication Use Process</li> <li>- Ensuring Quality in Pharmacy Operations</li> <li>- Risk Management in Contemporary Pharmacy Practice</li> <li>- Preventing and Managing Medication Errors: the Pharmacist’s Role</li> <li>- Compliance With Regulations and Regulatory Bodies</li> </ul>	4	8	All ILOs
3	<b>People Management</b>	<ul style="list-style-type: none"> <li>Managing Yourself for Success</li> <li>- Negotiation Skills</li> <li>- Organizational Structure and Behavior</li> </ul>	2	4	All ILOs
4	<b>Midterm Exam</b>		1	2	All ILOs



V. Course Content:					
A – Theoretical Aspect:					
Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact hours	Learning Outcomes
5	People Management	- Human Resources Management Functions - The Basics of Employment Law and Workplace Safety - Pharmacy Technicians 1- Performance Appraisal Systems	2	4	All ILOs
6	Money Management	Financial Reports - Budgeting - Third-Party Payer Considerations	1	2	All ILOs
7	Managing traditional goods and service	Marketing Fundamentals - Marketing Applications - Customer Service - Supply Chain Management 1. - Merchandising	1	2	All ILOs
8	Managing values added services	Value-Added Services as a Component of Enhancing Pharmacists' Roles in Public Health - Implementing Value-Added Pharmacist Services	1	2	All ILOs
9	Managemet applications in specific pharmacy practice setting	Entrepreneurship an Innovation - Applications in Independent Community Pharmacy	2	4	All ILOs
Number of Weeks /and Units Per Semester			15	30	

V. Teaching strategies of the course:
<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p> <p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>





**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> Each student presents seminar on selected topic of course	c1, c2	4-13	3
2	<b>Group :</b> Each group of students presents seminar on different Technology That Supports the Medication Use Process	c1, c2, d1, d2,	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, b1, b2, d1,d2



2	Assignments (1 + 2)	4-13, 14	5	5	c1, c2, d1, d2,
3	Quiz 1 + Quiz 2	7, 12	3	3	a1, b1
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, b1, b2, d1,d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, b1, b2, d1,d2
TOTAL			60	60 %	60

## VIII. Learning Resources:

- Written in the following order: ( Author - Year of publication – Title – Edition – Place of publication – Publisher).

### Required Textbook(s) (maximum two ).

- MD Karch, Drummer Steven B., Olaf, 2014. Leadership and Management in Pharmacy Practice, 2nd Edition, <https://doi.org/10.1201/b17919>

### Essential References.

- Shane P. Desselle, David P. Zgarrick, Greg L. Alston, 2020. Pharmacy Management: Essentials for All Practice Setting. 3rded.; ISBN: 978-0-07-177431-4
- Dennis Tootelian , 2012. Essentials of Pharmacy Management, 2nd,

### Electronic Materials and Web Sites etc.

- <https://www.ashp.org/Pharmacy-Practice/Policy-Positions-and-Guidelines/Browse-by-Topic/Pharmacy-Management?loginreturnUrl=SSOCheckOnly>
- <https://www.fip.org>





## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of **botany and medicinal plant**

### I. - Information about Faculty Member Responsible for the Course:

Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

### I. Course Description:

The course familiarizes the pharmacist to work effectively within a team in pharmaceutical organizations and how to effectively manage personnel and resources, how pharmaceutical organizations meet the challenges of today's dynamic business environment, and how companies compete successfully in the global market.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 3. Alignment CILOs to PILOs

No.	PILOs	CILOs
9.	A1	a1. Describe the principles and concepts of personnel and resources management.
10.	A1	a2. Discuss strategies for managers to support the employees and a team in pharmaceutical organizations.
11.	B1	b1. Demonstrate personnel and resources management skills
12.	B2	b2. Analyze the business opportunities and identify purchasing, receiving, merchandising and marketing strategies that would be implemented to best suit each environment.
13.	C1	c1. Use effectively management principles in pharmacy practice
14.	C1	c2. Successfully implement all activities about the pharmacy operations
15.	D1	d1. Communicate effectively in a team.
16.	D2	d2. Develop financial, sales and market management skills.

#### 4. Alignment CILOs to teaching strategies and assessment strategies

##### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Describe the principles and concepts of personnel and resources management.	Lecture	Theoretical exams
a2. Discuss strategies for managers to support the employees and a team in pharmaceutical organizations.	Demonstration	Assignments
	Practicing	Written exam ,
	Discussion	
	Demonstration	
	Lecture	

##### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Demonstrate personnel and resources management skills	Lecture	Theoretical exams
	Demonstration	Practical Test
	Practicing	



b2. Analyze the business opportunities and identify purchasing, receiving, merchandising and marketing strategies that would be implemented to best suit each environment.	Discussion Demonstration	Assignments
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1. Use effectively management principles in pharmacy practice	Lecture Demonstration	Theoretical exams Assignments
c2. Successfully implement all activities about the pharmacy operations	Practicing Discussion	
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1. Communicate effectively in a team.	<ul style="list-style-type: none"> <li>Discussion Strategy</li> <li>Case Method</li> <li>Work group</li> </ul>	<ul style="list-style-type: none"> <li>Use email to deliver assignments.</li> </ul>
d2. Develop financial, sales and market management skills.	Assignments	Using communication media by students (group working)

<b>V. Course Content:</b>					
<b>A – Theoretical Aspect:</b>					
Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact hours	Learning Outcomes
1	<b>Introduction</b>	<ul style="list-style-type: none"> <li>- The “Management” in Medication Therapy Management</li> <li>- Management Functions</li> <li>- Leadership in Pharmacy Practice</li> <li>- Ethical Decision-Making, Problem-Solving, and Delegating Authority</li> <li>- Creating and Managing Value</li> </ul>	2	4	All ILOs



<b>V. Course Content:</b>					
<b>A – Theoretical Aspect:</b>					
Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact hours	Learning Outcomes
2	<b>Operations Management</b>	Strategic Planning in Pharmacy Operations - Business Planning for Pharmacy Programs - Operations Management - Managing Technology That Supports the Medication Use Process - Ensuring Quality in Pharmacy Operations - Risk Management in Contemporary Pharmacy Practice - Preventing and Managing Medication Errors: the Pharmacist's Role - Compliance With Regulations and Regulatory Bodies	4	8	All ILOs
3	<b>People Management</b>	Managing Yourself for Success - Negotiation Skills - Organizational Structure and Behavior	2	4	All ILOs
4	<b>Midterm Exam</b>		1	2	All ILOs
5	<b>People Management</b>	- Human Resources Management Functions - The Basics of Employment Law and Workplace Safety - Pharmacy Technicians 2- Performance Appraisal Systems	2	4	All ILOs
6	<b>Money Management</b>	Financial Reports - Budgeting - Third-Party Payer Considerations	1	2	All ILOs



<b>V. Course Content:</b>					
<b>A – Theoretical Aspect:</b>					
Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact hours	Learning Outcomes
<b>7</b>	Managing traditional goods and service	Marketing Fundamentals - Marketing Applications - Customer Service - Supply Chain Management 2. - Merchandising	1	2	All ILOs
<b>8</b>	Managing values added services	Value-Added Services as a Component of Enhancing Pharmacists' Roles in Public Health - Implementing Value-Added Pharmacist Services	1	2	All ILOs
<b>9</b>	Managmenet applications in specific pharmacy practice setting	Entrepreneurship an Innovation - Applications in Independent Community Pharmacy	2	4	All ILOs
<b>Number of Weeks /and Units Per Semester</b>			<b>15</b>	<b>30</b>	





## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : Each student presents seminar on selected topic of course	c1, c2	4-13	3
2	<b>Group</b> : Each group of students presents seminar on different Technology That Supports the Medication Use Process	c1, c2, d1, d2,	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, b1, b2, d1,d2
2	Assignments (1 + 2)	4-13, 14	5	5	c1, c2, d1, d2,
3	Quiz 1 + Quiz 2	7, 12	3	3	a1, b1
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, b1, b2, d1,d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, b1, b2, d1,d2



TOTAL	60	60 %	60
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VIII. Learning Resources:	
<ul style="list-style-type: none"> <li>Written in the following order: ( Author - Year of publication – Title – Edition – Place of publication – Publisher).</li> </ul>	
Required Textbook(s) (maximum two ).	
	<ul style="list-style-type: none"> <li>MD Karch, Drummer Steven B., Olaf, 2014. Leadership and Management in Pharmacy Practice, 2nd Edition, <a href="https://doi.org/10.1201/b17919">https://doi.org/10.1201/b17919</a></li> </ul>
Essential References.	
	<ul style="list-style-type: none"> <li>Shane P. Desselle, David P. Zgarrick, Greg L. Alston, 2020. Pharmacy Management: Essentials for All Practice Setting. 3rded.; ISBN: 978-0-07-177431-4</li> <li>Dennis Tootelian , 2012. Essentials of Pharmacy Management, 2nd,</li> </ul>
Electronic Materials and Web Sites etc.	
	<ul style="list-style-type: none"> <li><a href="https://www.ashp.org/Pharmacy-Practice/Policy-Positions-and-Guidelines/Browse-by-Topic/Pharmacy-Management?loginreturnUrl=SSOCheckOnly">https://www.ashp.org/Pharmacy-Practice/Policy-Positions-and-Guidelines/Browse-by-Topic/Pharmacy-Management?loginreturnUrl=SSOCheckOnly</a></li> <li><a href="https://www.fip.org">https://www.fip.org</a></li> </ul>

IX.Course Policies:	
1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary





procedures will be according to the college rules.





## Course Specification

### PHYTOCHEMISTRY II

I. Course Identification and General Information:							
1.	Course Title:	PHYTOCHEMISTRY II					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( FOURTH ) Year – ( SECOND ) semester					
5.	Pre –requisite (if any):	• Phytochemistry I					
6.	Co –requisite (if any):	none					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of physicochemical properties, extraction, isolation and identification of active chemical constituents (phytochemicals) obtained from medicinal plants in particular phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Determine the botanical source and therapeutic uses of phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.
2.	A2	a2. Determine the physicochemical properties of phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.
3.	A3	a3. Discuss the methods and techniques used to extract and isolate phytochemicals
4.	A4	a4. Comprehend his/her role as a pharmacist in extraction, isolation and identification of phytochemicals.
5.	B1	b1. Express the chemical structure of phytochemicals using drawings.
6.	B2	b2. Differentiate between various types phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.
7.		b3. Solve problems related to nomenclature, identification and differentiation of phytochemicals.
8.		b4. Classify phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals. chemically and therapeutically
9.	B3	b5. Predict the outcomes of chemical reactions of alkaloids and terpenoids.
10.	B4	b6. Select the most appropriate technique for extraction and isolation of phytochemicals.
11.	C1	c1. Handle efficiently the tools and chemicals used in phytochemistry Lab.
12.		c2. Operate successfully the instruments used in phytochemistry Lab.
13.	C2	c3. Perform effectively the experiments, practical tasks including extraction, identification and isolation of phytochemicals using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works.



15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Show respect to life.
19.	D3	d3. Communicate effectively with his/her colleagues.
20.	D4	d4. Behave in discipline during practicing practical and professional works and assignments.
21.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture , feed-back learning laboratory practice	Written exam , Attendance, quizzes Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)



<b>b3</b>	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
<b>b4</b>	Lecture	Written exam , Attendance
<b>b5</b>	Lecture , feed-back learning	Written exam , Attendance, assignment, quizzes
<b>b6</b>	Lecture	Written exam , Attendance

**(C) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>c1, c2, c3, c4</b>	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
<b>c5</b>	feed-back learning, Group-project	Assignments
<b>c6</b>	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>d1, d3, d4</b>	laboratory practice	Practical assessment (Lab. attendance, attitude, practical exam)
<b>d1, d3, d4</b>	Feed-back learning	Assignments
<b>d2</b>	Lecture	Written exam , Attendance
<b>d5</b>	laboratory practice	Practical assessment (Lab. attendance, accomplishment, practical exam)
<b>d5</b>	Feed-back learning	Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Phenyl propane derivatives</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Introduction( definition, classification, biogenesis) <b>Hydroxycinnamic acids</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses <b>Cinnamicaldehydes and monolignols</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses <b>Coumarins</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses <b>Stilbenoids</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses	3	6
2	<b>Volatile oils</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Definition, classification, distribution and occurrence; Extraction : distillation methods and solvent extraction ; Chemical , physical and pharmacological properties examples of crude drugs containing volatile oils	3	6
Midterm exam				1	2
3	<b>Glycosides</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Introduction (definition, classification, distribution, extraction, isolation and pharmacological properties) <b>Cardioactive glycosides</b> (cardenolides, bufadienolides, sugars, structure activity relationship, distribution, extraction, chemical and physical properties, hydrolysis of cardiac glycosides,	3	6



			<p>biogenesis, pharmacological properties , mechanism of action, chemical tests. Chief drugs containing cardiac glycosides(Digitalis, strophanthus, Adonis, Convalaria and squill). <b>Saponin glycosides</b> (definition, classification, distribution, structures,biogenesis,chemical , physical properties , characterization, biological and pharmacological properties. Drugs as expectorant ,antitusive, antiexudative, adaptogens and diuretic) <b>Anthracen glycosides</b> (classification, distribution, structures, biosynthesis, extraction , chemical, physical properties, characterization, pharmacological properties, Senna, Rhabarub and Aloe) <b>Flavonoid glycosides</b>( classification, biosynthesis, chemical structure, physic-chemical properties, rutin, hesperidin and flavonoid containing drugs) <b>Cynogentic glycosides</b> (cynogenesis, distribution, structures, biogenesis, detection, extraction, pharmacological activities and cynogenetic drugs) <b>Glucosinolates(Thioglycosides):</b> definition, distribution, structures, biogenesis , hydrolysis, toxicity and drugs containing glucosinolates.</p>		6
4	<b>Tannins</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	definition, classification, structure, distribution, biosynthesis, physic-chemical properties, extraction, biological properties , examples of crude drugs containing tannins	1	2
5	<b>Steroids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Definition, classification, structures , biogenesis, chemical and physical properties and characterization.	1	2
6	<b>Miscellaneous e.g. bitter</b>	a1, a2, a3, a4,	Definition, classification, structures , biogenesis, chemical and physical	1	2



	<b>principles</b>	b1, b2, b3, b4, b5, b6, d2	properties and characterization.		
	<b>Course Review</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	6 Units





<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
physicochemical properties , extraction (maceration or percolation or soxhlet extraction ) , concentration (if necessary " rotary evaporation', isolation (Thin layer chromatography) and identification of the phytochemicals from crude drugs or parts of medicinal plants				
1.	Phenyl propane derivatives : ( cinnamic aldehyde)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2.	Volatile oils (peppermint oil )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
3.	Volatile oils ( clove oil )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
4.	Saponins (Glycyrrhizin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
5.	Flavonoids (Hesperetin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
6.	Flavonoids (apigenin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
7.	AnthracinGlycoside ( sennosides )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
8.	Cardiac Glycoside ( digoxin )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
9.	Tannins in Tea	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
10.	Miscellaneous: bitter principles ( Khellin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
11.	Review	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : each student will be assigned solve the problems provided by the teacher. The problems involve nomenclature, isolation , chemical reaction, etc.	b3, b5., c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to present 2-3 videos or simulations of one of the studied extraction , isolation techniques.	c5, c6, d1, d3, d5	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2
2	Assignments (1 + 2)	4, 14	5	5	b3, b5, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b2, b3, b5
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a2, a3, a4 , b1, b6, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
6	Practical exam (practical)	14	20	20	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders
2. Amritpal Singh Saroya, Herbalism, Phytochemistry and Ethnopharmacology, 2011, CRC press Jarald.

### 2- Essential References.

3. Bhandari. Textbook of pharmacognosy

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of PHYTOCHEMISTRY II

### I. - Information about Faculty Member Responsible for the Course:

Name of Faculty Member	Dr/ Wedad Al-Hadad	Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

### II. Course Description:

The course deals with the study of physicochemical properties, extraction, isolation and identification of active chemical constituents (phytochemicals) obtained from medicinal plants in particular phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 3. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Determine the botanical source and therapeutic uses of phenyl



		propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.
2.	A2	a2. Determine the physicochemical properties of phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.
3.	A3	a3. Discuss the methods and techniques used to extract and isolate phytochemicals
4.	A4	a4. Comprehend his/her role as a pharmacist in extraction, isolation and identification of phytochemicals.
5.	B1	b1. Express the chemical structure of phytochemicals using drawings.
6.	B2	b2. Differentiate between various types phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals.
7.		b3. Solve problems related to nomenclature, identification and differentiation of phytochemicals.
8.		b4. Classify phenyl propane derivatives, volatile oils, glycosides, tannins, steroid, and miscellaneous phytochemicals. chemically and therapeutically
9.	B3	b5. Predict the outcomes of chemical reactions of alkaloids and terpenoids.
10.	B4	b6. Select the most appropriate technique for extraction and isolation of phytochemicals.
11.	C1	c1. Handle efficiently the tools and chemicals used in phytochemistry Lab.
12.		c2. Operate successfully the instruments used in phytochemistry Lab.
13.	C2	c3. Perform effectively the experiments, practical tasks including extraction, identification and isolation of phytochemicals using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works.
15.	C4	c5. Search efficiently for information using documented and electronic sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Show respect to life.
19.	D3	d3. Communicate effectively with his/her colleagues.



20.	D4	d4. Behave in discipline during practicing practical and professional works and assignments.
21.	D5	d5. Demonstrate time management and self-learning during performing practical and professional works and assignments.

1. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2	lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture , feed-back learning laboratory practice	Written exam , Attendance, quizzes Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture , feed-back learning	Written exam , Attendance, assignment, quizzes
b6	Lecture	Written exam , Attendance
(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		



Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	laboratory practice	Practical assessment (Lab. attendance, attitude, practical exam)
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice	Practical assessment (Lab. attendance, accomplishment, practical exam)
d5	Feed-back learning	Assignments

#### IV. Course Content:

##### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
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1	<b>Phenyl propane derivatives</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	<p>Introduction( definition, classification, biogenesis)</p> <p><b>Hydroxycinnamic acids</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses</p> <p><b>Cinnamaldhydes and monlignols</b> ( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses</p> <p><b>Coumarins</b>( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses</p> <p><b>Stilbenoids</b>( Definition, classification, biosynthesis, chemical structure, physic-chemical properties, extraction , pharmacological properties and uses</p>	3	6
2	<b>Volatile oils</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	<p>Definition, classification, distribution and occurrence; Extraction : distillation methods and solvent extraction ; Chemical , physical and pharmacological properties examples of crude drugs containing volatile oils</p>	3	6
Midterm exam				1	2
3	<b>Glycosides</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	<p>Introduction (definition, classification, distribution, extraction, isolation and pharmacological properties)</p> <p><b>Cardioactive glycosides</b>(cardinolides, bufadienolides, sugars, structure activity relationship, distribution, extraction, chemical and physical properties, hydrolysis of cardiac glycosides, biogenesis, pharmacological properties , mechanism of action, chemical tests.</p> <p>Chief drugs containing cardiac glycosides(Digitalis, strophanthus, Adonis, Convalaria and squill).</p> <p><b>Saponin glycosides</b> (definition,</p>	3	6



			classification, distribution, structures, biogenesis, chemical, physical properties, characterization, biological and pharmacological properties. Drugs as expectorant, antitusive, antiexudative, adaptogens and diuretic) <b>Anthracen glycosides</b> (classification, distribution, structures, biosynthesis, extraction, chemical, physical properties, characterization, pharmacological properties, Senna, Rhabarub and Aloe) <b>Flavonoid glycosides</b> (classification, biosynthesis, chemical structure, physico-chemical properties, rutin, hesperidin and flavonoid containing drugs) <b>Cynogenic glycosides</b> (cynogenesis, distribution, structures, biogenesis, detection, extraction, pharmacological activities and cynogenetic drugs) <b>Glucosinolates(Thioglycosides):</b> definition, distribution, structures, biogenesis, hydrolysis, toxicity and drugs containing glucosinolates.		
4	<b>Tannins</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	definition, classification, structure, distribution, biosynthesis, physico-chemical properties, extraction, biological properties, examples of crude drugs containing tannins	1	2
5	<b>Steroids</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Definition, classification, structures, biogenesis, chemical and physical properties and characterization.	1	2
6	<b>Miscellaneous e.g. bitter principles</b>	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2	Definition, classification, structures, biogenesis, chemical and physical properties and characterization.	1	2
<b>Course Review</b>		a1, a2, a3, a4,	Review of the course topics by discussion session.	1	2



	b1, b2, b3, b4, b5, b6, d2			
FINAL - EXAM			1	2
TOTAL			16	32
Number of Weeks /and Units Per Semester			16 weeks	6 Units

### B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
physicochemical properties , extraction (maceration or percolation or soxhlet extraction ) ,				



concentration (if necessary " rotary evaporation', isolation (Thin layer chromatography) and identification of the phytochemicals from crude drugs or parts of medicinal plants				
1.	Phenyl propane derivatives : ( cinnamic aldehyde)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2.	Volatile oils (peppermint oil )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
3.	Volatile oils ( clove oil )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
4.	Saponins (Glycyrrhizin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
5.	Flavonoids (Hesperetin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
6.	Flavonoids (apigenin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
7.	AnthracinGlycoside ( sennosides )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
8.	Cardiac glycosides Glycoside ( Digoxin )	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
9.	Tannins in Tea	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
10.	Miscellaneous: bitter principles ( Khellin)	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
11.	Review	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.</p> <p>The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : each student will be assigned solve the problems provided by the teacher. The problems involve nomenclature, isolation , chemical reaction, etc.	b3, b5., c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to present 2-3 videos or simulations of one of the studied extraction , isolation techniques.	c5, c6, d1, d3, d5	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2
2	Assignments (1 + 2)	4, 14	5	5	b3, b5, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	3	3	b2, b3, b5
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a2, a3, a4 , b1, b6, d2
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4, d5
2	Lab. Attitude	weekly	2	2	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
6	Practical exam (practical)	14	20	20	a2, b1, b2 , b3, c1, c2, c3, c4, c5,
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. W.C. Evans, Trease and Evans pharmacognosy, 2009, W.B.Saunders
2. Amritpal Singh Saroya, Herbalism, Phytochemistry and Ethnopharmacology, 2011, CRC press Jarald.

### 2- Essential References.

1. Bhandari. Textbook of pharmacognosy

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course specification of: Molecular Biology

1.	Course Title :					Molecular Biology
2.	Course Code and Number:					
3.	Lecture	Training	Practical	Seminar/ Tutorial	Total	Credit Hours: 2
	2	-	-	-	2	
4.	Study Level and Semester:					Third Year –2 <sup>nd</sup> Semester
5.	Pre-requisites (if any):					General Biology
6.	None Co-requisites (if any):					None
7.	Program in which the course is offered:					Bachelor of Pharmacy
8.	Teaching Language:					English
9.	Study System:					Obligatory attendance
10.	Prepared by					Dr. Ali Alhawery
11.	Location of teaching the course:					Yemen University
12.	Date of Approval :					2015
13.	Approved by:					
I. Course Description :						
The course deals with the study of the molecular components of cell and their functions as well as the cell reproduction, DNA replication, transcription and translation processes.						

### Alignment CILOs to PILOs

PILOs	ILCOs	٢
A1	a1. Know cells and their types, as well as their molecular components.	a1
A2	a2. Understand the function of each molecular component of cell.	a2
A3	a3. Discuss the differences between the different molecular components of cell.	a3
B1	b1. Interpret certain body diseases based on disturbances in levels of cell molecular components.	b1



<b>B2</b>	b2 . Solve biochemical problems related to nomenclature, synthetic and metabolic reactions.	<b>b2</b>
	b3. Classify cell molecular components into various categories.	<b>b3</b>
	b4. Compare between different types of cell molecular components in terms of function, their role in cell division, DNA replication , transcription, and translation.	<b>b4</b>
<b>B3</b>	b5. Predict the outcomes of transcription and translation processes.	<b>b5</b>
<b>C1</b>	c1.Handleefficiently the tools and chemicals used in molecular biology Lab.	<b>c1</b>
	c2. Operate successfully the instruments used in molecular biology Lab.	<b>c2</b>
<b>C2</b>	c3 . Perform efficiently experiments and practical tasks for in vitro and in vivo identifications of molecular components using standard procedures.	<b>c3</b>
	c4. Take and prepare human samples to molecular investigations using standard procedures.	<b>c4</b>
<b>C3</b>	c5 .Take the required safety criteria during performing practical works in molecular biology Lab.	<b>c5</b>
<b>C4</b>	c6 .Appropriately search for information and also present and report his/her work using various source of information and media technologies..	<b>c6</b>
	c7. Use effectively symbols and figures and drawing to express molecular reactions and synthesis	<b>c7</b>
<b>D1</b>	d1. Work successfully in team-work.	<b>d1</b>
<b>D2</b>	d2. Show respect to life & behave in discipline during performing practical works in biochemistry Lab.	<b>d2</b>
<b>D3</b>	d3. Communicate effectively with his/her colleagues during performing practical works in in biochemistry Lab.	<b>d3</b>
<b>D4</b>	d4. Demonstrate time management and problem solving skills.	<b>d4</b>

## 1- Alignment of CILOs to Teaching and Assessment Strategies

### First: Alignment of Knowledge and Understanding with the CILOs

Knowledge and Understanding ILCOs	Teaching Strategies	Assessment Strategies
a1	Lecture,	written exam , assignment
a2	Lecture,, feed-back learning	written exam , quizzes

a3	Lecture, feed-back learning, Group-project	written exam, ,assignment
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Second: Alignment of Intellectual Skills with the CILOs		
Intellectual Skills CILOs	Teaching Strategies	Assessment Strategies
b1	lecture, group-project, feed-back learning	. Written exam, assignments
b2,b3,b4	Lecture, , feed-back learning	written exam , quizzes
b5	Lecture,, feed-back learning	written exam, quizzes

Third: Alignment of Professional and Practical Skills with the CILOs		
Professional and Practical Skills CILOs	Teaching Strategies	Assessment Strategies
c1, c2	Lecture, , feed-back learning	Written exam, assignments
c3, c4	Lecture, , feed-back learning	Written exam, assignments
c5	Lecture, , feed-back learning	written exam, quizzes
c6, c7	Group-project, feed-back learning	Written- exam , , assignments

Fourth: Alignment of Transferable (General) Skills with the CILOs		
Transferable (General) Skills CILOs	Teaching Strategies	Assessment Strategies
d1	Group-project , feed-back learning	Written- exam , , assignments
d2	lecture	Written exam, quizzes
d3	Lecture, , feed-back learning	Written exam, assignments
d4	Lecture, , feed-back learning	Written exam, assignments

No.	Course Topics/Units	Sub-topics	No. of Weeks	Contact hours	CILOs
1	Introduction to Molecular Biology	<ul style="list-style-type: none"> <li>- Definition of the cell molecular biology,</li> <li>- Types of cell (prokaryotic and Eukaryotic )</li> </ul>	1	2	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
2	Eukaryotic cell	<ul style="list-style-type: none"> <li>- cell membrane structure</li> <li>- Intercellular junctions</li> <li>- Inter cellular communications</li> <li>- Transport through the cell membrane</li> </ul>	2	4	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
3	Intracellular components of cell	<ul style="list-style-type: none"> <li>-Nucleus (structure, function molecular components ,and their role in molecular biology)</li> <li>- Mitochondria (structure, function molecular components ,and their role in molecular biology)</li> <li>- Endoplasmic reticulum (structure, function molecular components ,and their role in molecular biology)</li> <li>- Golgi bodies, lysosomes, cytoskeleton, centrosomes (structure, function molecular components ,and their role in molecular biology)</li> </ul>	4	8	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
4	Reproduction of cell	<ul style="list-style-type: none"> <li>- Interphase and mitosis</li> <li>- Meiosis</li> </ul>	2	4	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
Midterm Exam			1	2	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
5	Nucleic acids (DNA and RNA ), DNA replication	-Definitions , replication processes	2	4	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
6	Transcription	-Definitions , transcription processes	1	2	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
7	Translation and protein synthesis	-Definitions , replication processes	1	2	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
8	Revision		1	2	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2

Final exam	1	2	
Total number of weeks and hours	16	32	

## I. Teaching Strategies

- Lecture:** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom  
 The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming:** It depends on stimulation of the student's brain through a group of questions &/or **Concepts map:** which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning:** students are individually asked to do certain assignments such as summarizing, internet search, make charts or solve mathematical problems related to the courses topics. The teacher will provide them feed-back correction & evaluation.
- Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing, using the results in practical manner & for promoting team work skills.

## II. Tasks and Assignments :

No.	Task/Assignment	CILOs	Week due	Mark
1	<b>Individual:</b> the teacher provide the students with molecular biology problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b2, c5, d4	4-13	3
2	<b>Group :</b> each group of students will be assigned to present a search report on one pathological condition related to disturbances in molecular biology levels in the body.	b1, d1, , c6	14	2

## III. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course (CILOs)
1	Attendance	1 - 15	5	5 %	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
2	Assignments (1 + 2)	4-13, 14	10	10 %	b1, b2, c5, c6, d1, d4,
3	Quiz 1 + Quiz 2	7, 12	5	5 %	b2, b5
4	Mid-semester	7	20	20 %	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
5	Final exam ( written exam)	17	60	60 %	a1, a2, a3, b1, b2, b3, b4, b5, b6, c7, d2
TOTAL			100	100 %	

### Essential References-not less than 4

1. Robert Schleif (1993) Genetics and Molecular Biology . 2nd Edition, The Johns Hopkins Press Ltd., London
2. Daniel Böhmer, Vanda Repiská, Luboš Danišovic (2010). Introduction to Medical and Molecular Biology, Asklepios, Bratislava.
3. [www.en.wikipedia.org/](http://www.en.wikipedia.org/)

V.	IV. Course Policies:
1	<b>Class Attendance:</b> Student should attend at least 75% of the total contact hours of the subject; otherwise he/she will not be allowed to sit for the course exam and will be considered as exam failure. If the student's absence repeated due to illness, he/she will be demanded to provide a definite proof from the university Clinic. If the student's absence rate is above 25% of the course total contact hours without a reasonable excuse, he/she will be notified to study the entire course again.
2	<b>Tardiness:</b> Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course according the university regulations.
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules
7	<b>Other policies:</b> <ul style="list-style-type: none"><li>- The mobile is not allowed to be used during the lecture. It must be turned off, otherwise the student will be asked to leave the lecture room.</li><li>- The mobile is not allowed to be taken to the exam hall.</li><li>- Lecture notes and assignments may be given directly to students using soft or hard copy.</li><li>- Students should familiarize themselves with all University and College Policies that cover students' rights, responsibilities and the Academic Appeal process.</li></ul>



## Course Specification

### APPLIED PHARMACOGNOSY I

I. Course Identification and General Information:							
1.	Course Title:	APPLIED PHARMACOGNOSY I					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 1 <sup>ST</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"><li>• phytochemistry I , II</li><li>• Pharmaceutical analytical chemistry I &amp; II</li></ul>					
6.	Co –requisite (if any):						
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10.	Prepared By:						
11.	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of principles and techniques used to elucidate the quality and to perform phytochemical screening of herbal products.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Identify the physicochemical properties of phytochemicals that are used to evaluate their qualities in herbal products.
2.	A3	a2. Discuss the references, techniques and procedures applied to evaluate the quality of herbal products.
3.		a3. Explicit the principles of phytochemical screening.
4.	A4	a4. Comprehend his/her role as a pharmacist in evaluating the quality of herbal products.
5.	B1	b1. Express the quality of herbal products using quantitative or qualitative data.
6.		b2. Interpret the out-coming data obtained after qualitative or quantitative analysis of herbal products
7.	B2	b3. Solve problems related to quality of herbal products.
8.		b4. Classify the techniques used to elucidate quality control and phytochemical screening of herbal products.
9.	B4	b5. Assess the quality of herbal products.
10.		b6. Select the appropriate technique to assess a quality parameter
11.	C1	c1. Handle efficiently the tools and chemicals used in pharmaceutical analysis and quality control lab.
12.		c2. Operate successfully the instruments used in pharmaceutical analysis and quality control lab.
13.	C2	c3. Perform effectively the experiments, practical tasks using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works.
15.	C4	c5. Search efficiently for information using documented and electronic sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Work successfully in team-work.
18.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.

19.	D3	d3.Communicate effectively with colleagues.
20.	D4	d4. Demonstrate the ability of time management , self-learning and problem solving.

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2, a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture	Written exam , Attendance
b3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), Assignments , quizzes
b4	Lecture	Written exam , Attendance

b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5 , c6	feed-back learning, Group-project laboratory practice	Assignments , Practical assessment (Lab. attendance, reporting, practical exam)
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d2, d3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>phytochemical screening</b>	a2, a4	<ul style="list-style-type: none"> <li>definition</li> <li>purposes</li> <li>techniques</li> <li>screening of alkaloids, glycosides, saponins, flavonoids , etc.</li> </ul>	4	8
2	<b>specifications of herbal products</b>	a3, a4	pharmacopeial specifications of various types of herbal products : physical , microscopical, chromatographic, ash values , etc.	2	4
	midterm exam			1	2
3	<b>spectroscopic &amp; analysis of herbal products</b>		<p>applications of spectroscopic techniques in analysis of phytochemical constituents :</p> <ul style="list-style-type: none"> <li>○ Infrared</li> <li>○ UV-visible and fluorescence spectrophotometry</li> <li>○ Mass spectroscopy</li> <li>○ NMR spectroscopy</li> </ul> <p>( Note: the principles and instrumentations have been discussed previously in pharmaceutical analytical chemistry II course)</p>	3	6
4	<b>Advanced chromatographic techniques applied in herbal medicine</b>		<p><b>Theoretical principle and components , components interactions , types, instrumentation, factors affecting, output data, applications in quantitative/qualitative analysis , applications in pharmacognosy &amp; phytochemistry:</b></p> <ul style="list-style-type: none"> <li>• High performance liquid chromatography (HPLC)</li> <li>• Ultra High performance liquid chromatography (UHPLC)</li> <li>• Counter-current Chromatography</li> <li>• Gas chromatography: gel –liquid,</li> </ul>	4	8

			capillary-electrophoresis		
Course Review		a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	4 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	phytochemical screening of alkaloids, glycosides, saponins, volatile oils, etc in different herbal products available in the market	4	8	a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2.	spectroscopic analysis of different types of herbal products available in the market	3	6	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
3.	HPLC analysis of different types of herbal products available in the market	3	6	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
4.	Review	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve the problems provided by the teacher at the end of each unit	b3, c6, d4	4-13	3
2	<b>Group :</b> each group of students will be assigned to provide a search-based report on comparison between BP & USP pharmacopeial specifications of different types of herbal products. •	c5, c6, d1, d2, d3, d4	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
2	Assignments (1 + 2)	4, 14	5	5	b3, c5, c6, d1, d2, d3, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b4, b6, b7, b8, b9
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b2, b2, b3, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b2, b3, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Marayya. Quality assurance and quality management in pharmaceutical industry
2. British pharmacopeia, 2013 Manohar. pharmaceutical quality assurance

### 2- Essential References.

1. USP, 2009
2. A. P. Kulkarni. Process instrumentation And control
3. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 3- Electronic Materials and Web Sites etc.

- [www.en.wikipedia.org/](http://www.en.wikipedia.org/)
- [www.pharmacoeia.com](http://www.pharmacoeia.com)
- [www.usp.org](http://www.usp.org)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

## Course Plan (Syllabus) of

### APPLIED PHARMACOGNOSY I

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of principles and techniques used to elucidate the quality and to perform phytochemical screening of herbal products.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Identify the physicochemical properties of phytochemicals that are used to evaluate their qualities in herbal products.
2.	A3	a2. Discuss the references, techniques and procedures applied to evaluate the quality of herbal products.
3.		a3. Explicit the principles of phytochemical screening.
4.	A4	a4. Comprehend his/her role as a pharmacist in evaluating the quality of herbal products.
5.	B1	b1. Express the quality of herbal products using quantitative or qualitative data.
6.		b2. Interpret the out-coming data obtained after qualitative or quantitative analysis of herbal products
7.	B2	b3. Solve problems related to quality of herbal products.
8.		b4. Classify the techniques used to elucidate quality control and phytochemical screening of herbal products.
9.	B4	b5. Assess the quality of herbal products.
10.		b6. Select the appropriate technique to assess a quality parameter
11.	C1	c1. Handle efficiently the tools and chemicals used in pharmaceutical analysis and quality control lab.
12.		c2. Operate successfully the instruments used in pharmaceutical analysis and quality control lab.
13.	C2	c3. Perform effectively the experiments, practical tasks using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works.
15.	C4	c5. Search efficiently for information using documented and electronic sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Work successfully in team-work.
18.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.

19.	D3	d3.Communicate effectively with colleagues.
20.	D4	d4. Demonstrate the ability of time management , self-learning and problem solving.

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2, a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture	Written exam , Attendance
b3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), Assignments , quizzes
b4	Lecture	Written exam , Attendance

b5, b6	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5 , c6	feed-back learning, Group-project laboratory practice	Assignments , Practical assessment (Lab. attendance, reporting, practical exam)
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d2, d3	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>phytochemical screening</b>	a2, a4	<ul style="list-style-type: none"> <li>• definition</li> <li>• purposes</li> <li>• techniques</li> <li>• screening of alkaloids, glycosides, saponins, flavonoids , etc.</li> </ul>	4	8
2	<b>specifications of herbal products</b>	a3, a4	pharmacopeial specifications of various types of herbal products : physical , microscopical, chromatographic, ash values , etc.	2	4
	midterm exam			1	2
3	<b>spectroscopic &amp; analysis of herbal products</b>		<p>applications of spectroscopic techniques in analysis of phytochemical constituents :</p> <ul style="list-style-type: none"> <li>○ Infrared</li> <li>○ UV-visible and fluorescence spectrophotometry</li> <li>○ Mass spectroscopy</li> <li>○ NMR spectroscopy</li> </ul> <p>( Note: the principles and instrumentations have been discussed previously in pharmaceutical analytical chemistry II course)</p>	3	6
4	<b>Advanced chromatographic techniques applied in herbal medicine</b>		<p><b>Theoretical principle and components , components interactions , types, instrumentation, factors affecting, output data, applications in quantitative/qualitative analysis , applications in pharmacognosy &amp; phytochemistry:</b></p> <ul style="list-style-type: none"> <li>• High performance liquid chromatography (HPLC)</li> <li>• Ultra High performance liquid chromatography (UHPLC)</li> <li>• Counter-current Chromatography</li> <li>• Gas chromatography: gel –liquid,</li> </ul>	4	8

			capillary-electrophoresis		
Course Review		a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	4 Units

<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	phytochemical screening of alkaloids, glycosides, saponins, volatile oils, etc in different herbal products available in the market	4	8	a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2.	spectroscopic analysis of different types of herbal products available in the market	3	6	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
3.	HPLC analysis of different types of herbal products available in the market	3	6	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
4.	Review	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>



## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to solve the problems provided by the teacher at the end of each unit	b3, c6, d4	4-13	3
2	<b>Group :</b> each group of students will be assigned to provide a search-based report on comparison between BP & USP pharmacopeial specifications of different types of herbal products. •	c5, c6, d1, d2, d3, d4	14	2

## VII. Schedule of Assessment Tasks for Students During the Semester

Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
2	Assignments (1 + 2)	4, 14	5	5	b3, c5, c6, d1, d2, d3, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b4, b6, b7, b8, b9
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b2, b2, b3, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b2, b3, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Marayya. Quality assurance and quality management in pharmaceutical industry
2. British pharmacopeia, 2013 Manohar. pharmaceutical quality assurance

### 2- Essential References.

1. USP, 2009
2. A. P. Kulkarni. Process instrumentation And control
3. Ansel`s Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 3- Electronic Materials and Web Sites etc.

- [www.en.wikipedia.org/](http://www.en.wikipedia.org/)
- [www.pharmacoeia.com](http://www.pharmacoeia.com)
- [www.usp.org](http://www.usp.org)

## X. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### APPLIED PHARMACOGNOSY II

I. Course Identification and General Information:							
1.	Course Title:	APPLIED PHARMACOGNOSY II					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 2 <sup>ND</sup> ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"><li>• GENERAL Pharmacognosy I &amp; II</li><li>• Pharmacology I &amp; II , III&amp; IV</li></ul>					
6.	Co –requisite (if any):	NONE					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of methods of complementary and alternative herbal medicine.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the diseases/ disorders of the body which can be treated by complementary and alternative medicine including traditional herbal therapies i& evidence-based phytotherapy
2.	A2	a2. Explain the biological effects of phytotherapy on body systems.
3.	A3	a3. Discuss the principles of complementary and alternative medicine including traditional herbal therapies i& evidence-based phytotherapy.
4.		a4. Recognize the concepts of traditional medicine, integrated medicine & Pharmacovigilance in complementary and alternative medicine.
5.	A4	a5. Comprehend his/her role as a pharmacist in employing and assessing benefits and risks of complementary and alternative medicine
6.	B2	b1. Classify different types of traditional & phytotherapeutic complementary and alternative medicine
7.		b2. Compare different methods applied in complementary and alternative herbal medicine based on benefits and risks.
8.	B3	b3. Predict the adverse effects of techniques applied in complementary and alternative medicine
9.	B4	b4. Assess the benefit/risks of techniques applied in complementary and alternative herbal medicine
10.		b5. Select an appropriate non-classical therapeutic method for patients.
11.	C2	c1. Provide correct information on techniques applied in complementary and alternative medicine to patients and physicians.
12.	C4	c2. Search efficiently for information using documented and electronic sources of information.
13.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Work successfully in team-activities.
15.	D2	d2. Show respect to life.
16.	D3	d3. Communicate effectively and cooperate with colleagues.
17.	D4	d4. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4, a5	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2 , b3 , b4, b5	Lecture, feed-back learning	Written exam , Attendance , quizzes , assignments

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Lecture	Written exam , Attendance
c2 , c3	feed-back learning, Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a2, a3, a4, a5, b1, b2, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> The complementary and alternative concept of healthcare</li> <li><input type="checkbox"/> Comparison with classical methods of therapy (Benefits/risk ; evidence/non-evidence based)</li> <li><input type="checkbox"/> The principles of complementary and alternative herbal medicine</li> <li><input type="checkbox"/> alternative medicine into practice</li> <li><input type="checkbox"/> Delivering complementary and Complementary and alternative herbal medicine</li> <li><input type="checkbox"/> Pharmacovigilance of complementary herbal medicines</li> </ul>	2	4
2	<b>Traditional herbal therapies</b>	a1, a2, a3, a4, a5, c1, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> The traditional healthcare environment and references</li> <li><input type="checkbox"/></li> <li><input type="checkbox"/> Concepts , principles and applications of <ul style="list-style-type: none"> <li>• Traditional Chinese medicine</li> <li>• Indian Ayurveda medicine</li> <li>• Traditional medicine in Yemen</li> </ul> </li> </ul>	2	4
3	<b>evidence-based herbal medicine</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2	Principles , applications , benefit/risks of : <ol style="list-style-type: none"> <li>1- Homeopathy and anthroposophy</li> <li>2- Aromatherapy</li> <li>3- Flower remedy therapy</li> <li>4- phytotherapy</li> </ol>	2	4
<ul style="list-style-type: none"> <li>• MID-TERM EXAM</li> <li>• Post-exam discussion</li> </ul>				1	2



4	<b>Products of phytotherapy</b>	a1, a2, a5, b3, b4, b5, c1, d2	<p>□ <b>Topical products</b> : demulcents, antiinflammatorys, antiseptic disinfectants, treatment of burn and wounds.</p> <p>□ <b>Oral products</b> : recommended herbals or herbal combinations , their doses and preparations for treatment of</p> <ul style="list-style-type: none"> <li>• Respiratory diseases (common cold, asthma, cough)</li> <li>• GIT disorders (diarrhea, constipation, peptic ulcer, intestinal colic)</li> <li>• Renal disorders: stones, renal colic</li> <li>• CVS disorders: hypertension, angina</li> <li>• Endocrinology disorders: diabetes mellitus</li> <li>• Pain and inflammation</li> <li>• Hepatic dysfunction</li> <li>• Bacterial infections</li> <li>• Fungal infections</li> <li>• Parasital infections: malaria, helminthes</li> <li>• Erectile dysfunction</li> <li>• Amenorrhea</li> <li>• Infertility</li> <li>• Mental disorders: depression and psychosis</li> </ul>	7	14
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units





## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search-report on benefit/risks of complementary & alternative herbal therapies studied in this course	b2, b4, c2, c3, d4	4-13	6
2	<b>Group</b> : each group of students will be assigned to do compare the benefit/risks of a groups of complementary & alternative herbal therapies comparison to classical drug therapy.	b2, b4, c2, c3, d1, ,d3, d4	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, b4, c2, c3, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b4, b5
4	Mid-semester exam of theoretical part (written exam)	7	20	20	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part (written exam)	17	60	60	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Steven B Kayne. Complementary and alternative medicine, 2009, Pharmaceutical press.
2. Karin Kraft. Pocket guide to herbal medicine, 2004 Georg Thieme Verlag

### 2- Essential References.

1. Joshi. Essentials of orthopaedics and applied physiotherapy
2. Sanjay Pandya. Practical Guidelines on Fluid Therapy
3. Basantakumar Nanda. Electrotherapy simplified

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### APPLIED PHARMACOGNOSY II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of methods of complementary and alternative herbal medicine.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the diseases/ disorders of the body which can be treated by complementary and alternative medicine including traditional herbal therapies i& evidence-based phytotherapy
2.	A2	a2. Explain the biological effects of phytotherapy on body systems.
3.	A3	a3. Discuss the principles of complementary and alternative medicine including traditional herbal therapies i& evidence-based phytotherapy.
4.		a4. Recognize the concepts of traditional medicine, integrated medicine & Pharmacovigilance in complementary and alternative medicine.
5.	A4	a5. Comprehend his/her role as a pharmacist in employing and assessing benefits and risks of complementary and alternative medicine
6.	B2	b1. Classify different types of traditional & phytotherapeutic complementary and alternative medicine
7.		b2. Compare different methods applied in complementary and alternative herbal medicine based on benefits and risks.
8.	B3	b3. Predict the adverse effects of techniques applied in complementary and alternative medicine
9.	B4	b4. Assess the benefit/risks of techniques applied in complementary and alternative herbal medicine
10.		b5. Select an appropriate non-classical therapeutic method for patients.
11.	C2	c1. Provide correct information on techniques applied in complementary and alternative medicine to patients and physicians.
12.	C4	c2. Search efficiently for information using documented and electronic sources of information.
13.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Work successfully in team-activities.
15.	D2	d2. Show respect to life.
16.	D3	d3. Communicate effectively and cooperate with colleagues.
17.	D4	d4. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4, a5	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2 , b3 , b4, b5	Lecture, feed-back learning	Written exam , Attendance , quizzes , assignments

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Lecture	Written exam , Attendance
c2 , c3	feed-back learning, Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a2, a3, a4, a5, b1, b2, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> The complementary and alternative concept of healthcare</li> <li><input type="checkbox"/> Comparison with classical methods of therapy (Benefits/risk ; evidence/non-evidence based)</li> <li><input type="checkbox"/> The principles of complementary and alternative herbal medicine</li> <li><input type="checkbox"/> Delivering complementary and alternative medicine into practice</li> <li><input type="checkbox"/> Delivering complementary and alternative herbal medicine</li> <li><input type="checkbox"/> Pharmacovigilance of complementary herbal medicines</li> </ul>	2	4
2	<b>Traditional herbal therapies</b>	a1, a2, a3, a4, a5, c1, d2	<ul style="list-style-type: none"> <li><input type="checkbox"/> The traditional healthcare environment and references</li> <li><input type="checkbox"/> Concepts , principles and applications of <ul style="list-style-type: none"> <li>• Traditional Chinese medicine</li> <li>• Indian Ayurveda medicine</li> <li>• Traditional medicine in Yemen</li> </ul> </li> </ul>	2	4
3	<b>evidence-based herbal medicine</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2	Principles , applications , benefit/risks of : <ul style="list-style-type: none"> <li>5- Homeopathy and anthroposophy</li> <li>6- Aromatherapy</li> <li>7- Flower remedy therapy</li> <li>8- phytotherapy</li> </ul>	2	4
<ul style="list-style-type: none"> <li>• MID-TERM EXAM</li> <li>• Post-exam discussion</li> </ul>				1	2



4	<b>Products of phytotherapy</b>	a1, a2, a5, b3, b4, b5, c1, d2	<p>□ <b>Topical products</b> : demulcents, antiinflammatory, antiseptic disinfectants, treatment of burn and wounds.</p> <p>□ <b>Oral products</b> : recommended herbals or herbal combinations , their doses and preparations for treatment of</p> <ul style="list-style-type: none"> <li>• Respiratory diseases (common cold, asthma, cough)</li> <li>• GIT disorders (diarrhea, constipation, peptic ulcer, intestinal colic)</li> <li>• Renal disorders: stones, renal colic</li> <li>• CVS disorders: hypertension, angina</li> <li>• Endocrinology disorders: diabetes mellitus</li> <li>• Pain and inflammation</li> <li>• Hepatic dysfunction</li> <li>• Bacterial infections</li> <li>• Fungal infections</li> <li>• Parasital infections: malaria, helminthes</li> <li>• Erectile dysfunction</li> <li>• Amenorrhea</li> <li>• Infertility</li> <li>• Mental disorders: depression and psychosis</li> </ul>	7	14
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units





## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
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No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to do a search-report on benefit/risks of complementary & alternative herbal therapies studied in this course	b2, b4, c2, c3, d4	4-13	6
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## VII. Schedule of Assessment Tasks for Students During the Semester

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1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, b4, c2, c3, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b4, b5
4	Mid-semester exam of theoretical part (written exam)	7	20	20	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part (written exam)	17	60	60	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100

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Republic of Yemen  
Ministry of Higher Education  
& Scientific Research  
Yemen University  
College of medical sciences  
Department of pharmacy  
Program of Pharmacy Bachelor



الجمهورية اليمنية  
وزارة التعليم العالي والبحث العلمي  
جامعة اليمن  
كلية العلوم الطبية  
قسم الصيدلة  
برنامج بكالوريوس الصيدلة



## Course Specification

### Science & technology of cosmetic production

I. Course Identification and General Information:					
1.	Course Title:	Science & technology of cosmetic production			
2.	Course Code & Number:				
3.	Credit hours:	C.H			TOTAL
		Theoretical		P.	
		L.	Tut.	S.	
		2	-	-	2
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 1ST ) semester			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Pharmaceutics I, II , III , IV</li> </ul>			
6.	Co –requisite (if any):	None			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10.	Prepared By:				
11.	Date of Approval	2015			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course is designed to provide the students with knowledge and skills necessary for preparation of cosmetic and cosmeceuticals preparations that are used for cleaning, perfuming, changing the appearance , correcting odors protecting and others.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	ax. Explicit the general properties, advantages , disadvantages and requirements of cosmetics and cosmeceuticals,
2.	A3	a2. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types of cosmetic preparations
3.		a3. Explicit the types and roles of excipients included in different types of cosmetic preparations.
4.	A4	a4. Comprehend his/her role as pharmacist in formulation of cosmetic preparations. .
5.	B1	b1. Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a cosmetic preparation. ..
6.	B2	b2 .Categorize cosmetic preparations according to their use and physical form.
7.		b3. Compare between various types of cosmetic preparations. .
8.	B3	b4. Relate the selection of excipients and the method of preparation of cosmetic preparations .to formulation, compatibility and stability factors.
9.		b5. Formulate the ingredient into an appropriate cosmetic preparations.
10.	B4	b6 . Assess the quality of the prepared cosmetic preparations.
11.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceutics Lab.
12.		c2. Operate successfully the instruments used in pharmaceutics Lab.
13.	C2	c3. Prepare successfully pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms using standard procedures.
14.	C3	c4 .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceutics Lab.
15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practical works.



19.	D3	d2. Communicate effectively with his/her colleagues.
20.	D4	d4. Demonstrate the ability of time management , self-learning and problem solving.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2, a3	Lecture	Written exam , Attendance
a4	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2, b3, b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)



c5	Feed-back learning, Group-project	Assignments
c6	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d2, d3	laboratory practice, Feed-back learning, group project	Practical assessment (Lab. attendance, attitude, practical exam), Assignments
d4	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) , Assignments





## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a2, a3, a4, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>definitions (cosmetic preparations, cosmeceuticals)</li> <li>requirements cosmetics preparations registration,</li> <li>Pharmaceutical classification of cosmetic preparations <ul style="list-style-type: none"> <li>cosmetic solutions and oils</li> <li>cosmetic suspensions and foams</li> <li>Cosmetic emulsions</li> <li>Cosmetics solids and semisolids</li> </ul> </li> </ul>	1	2
2	<b>Skin-care cosmetic products</b>	a1, a2, a3, a4, b2, b3, b4, b5	agents, formulations, method of preparations, examples of : a) Anti-wrinkle or anti-aging products including face-masks b) Demulcents and moisturizing products c) Anti-acne products d) Skin- tanning products e) Skin-whitening products f) Hygienic and baby care products	3	6
3	<b>Make-up and removing make-up products:</b>	a1, a2, a3, a4, b2, b3, b4, b5	agents,formulations, method of preparations: a) Lipsticks b) pencils c) Make up powder d)Make up removing products	2	4
Mid-term exam				1	2
4	<b>Bath and cleansing products</b>	a1, a2, a3, a4, b2, b3, b4, b5	agents,formulations, method of preparations: a) Shampoos b) Soaps	1	2



5	<p>Department of Pharmacy Bachelor</p> <ul style="list-style-type: none"> <li><b>Hair care products</b></li> </ul>	a1, a2, a3, a4, b2, b3, b4, b5	<p>agents, formulations, method of preparations:</p> <p>a) hair tints (coloring) and bleaches (discoloring),</p> <p>b) conditioning products for waving, straightening and fixing,</p> <p>c) Depilatories (hair removals).</p> <p>d) hair cleansing products (lotions, powders, shampoo)</p> <p>e) Shaving products (creams, foams, lotions, etc.).</p>	2	4
	<b>Pleasantly Odorants</b>	a1, a2, a3, a4, b2, b3, b4, b5	<p>agents, formulations, method of preparations:</p> <p>a) Perfumes</p> <p>b) toilet waters</p> <p>c) eau de Colog.</p>	2	4
	<b>Oral and dental hygiene products</b>	a1, a2, a3, a4, b2, b3, b4, b5	<p>agents, formulations, method of preparations:</p> <p>a) Toothpaste</p> <p>b) Mouthwashes</p> <p>c) Dental gels</p>	2	4
	<b>Course Review</b>	a1, a2, a3, a4, b2, b3, b4, b5	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

**B - Practical Aspect:**



Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	Introduction to lab: list of experiments, how to report, etc	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2.	preparation of anti-aging skin creams, ant-acne dermatological form.	2	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
3.	preparation of lipsticks	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4.	preparation of antiseptic soap	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
5.	preparation of antidandruff shampoo	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
6.	preparation of hair nutrient oil	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
7.	preparation of after-shaving product	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
8.	preparation of perfumes	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
9.	preparation of toothpaste	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
10.	preparation of dental gel		2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to present a search report supported with images on 5 trade names (commercial preparations) of the studied cosmetic preparations	c5, c6, d4	4-13	3
2	<b>Group</b> :every group is assigned to present an illustrating videos on lab. And industrial preparation of 3 types of cosmetic preparations	c5, c6, d1, d4	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b2, b3, b4, b5
2	Assignments (1 + 2)	4, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a3, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b2, b3, b4, b5
TOTAL			60	60 %	60

### Practicalpart assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	



## VIII. Learning Resources

### 1- Required Textbook(s) ( maximum two ).

1. Hans Mollet, Arnold Grubenmann. Formulation Technology: Emulsions, Suspensions, Solid Forms, 2001 Wiley-VCH Verlag, Wells.
2. Ernest W. Flick. Cosmetic and toiletry formulations, 1996, Noyes Publications

### 2- Essential References.

1. Saraf. Cosmetics
2. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
3. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of COSMETIC PREPARATIONS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course is designed to provide the students with knowledge and skills necessary for preparation of cosmetic and cosmeceuticals preparations that are used for cleaning, perfuming, changing the appearance , correcting odors protecting and others.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	ax. Explicit the general properties, advantages , disadvantages and requirements of cosmetics and cosmeceuticals,
2.	A3	a2. Discuss the principles, pharmacopeial requirements, methods of preparation, of various types of cosmetic preparations
3.		a3. Explicit the types and roles of excipients included in different types of cosmetic preparations.
4.	A4	a4. Comprehend his/her role as pharmacist in formulation of cosmetic preparations. .
5.	B1	b1. Calculate the amount of ingredient required to prepare an enlarged or reduced amount of a cosmetic preparation. ..
6.	B2	b2 .Categorize cosmetic preparations according to their use and physical form.
7.		b3. Compare between various types of cosmetic preparations. .
8.	B3	b4. Relate the selection of excipients and the method of preparation of cosmetic preparations .to formulation, compatibility and stability factors.
9.		b5. Formulate the ingredient into an appropriate cosmetic preparations.
10.	B4	b6 . Assess the quality of the prepared cosmetic preparations.
11.	C1	c1.Handle efficiently the tools and chemicals used in pharmaceutics Lab.
12.		c2. Operate successfully the instruments used in pharmaceutics Lab.
13.	C2	c3. Prepare successfully pharmaceutical solid dosage forms including tablets and capsules and sterile pharmaceutical dosage forms using standard procedures.
14.	C3	c4 .Take the required safety criteria during preparation pharmaceutical dosage forms in pharmaceutics Lab.
15.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practical works.





19.	D3	d2. Communicate effectively with his/her colleagues.
20.	D4	d4. Demonstrate the ability of time management , self-learning and problem solving.

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture	Written exam , Attendance
a2, a3	Lecture	Written exam , Attendance
a4	Lecture , laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b2, b3, b4	Lecture	Written exam , Attendance, quizzes
b5	Lecture	Written exam , Attendance
b6	laboratory practice	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)



c5	Feed-back learning, Group-project	Assignments
c6	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, reporting, practical exam), Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d2, d3	laboratory practice, Feed-back learning, group project	Practical assessment (Lab. attendance, attitude, practical exam), Assignments
d4	laboratory practice, Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) , Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction</b>	a1, a2, a3, a4, b2, b3, b4, b5	<ul style="list-style-type: none"> <li>definitions (cosmetic preparations, cosmeceuticals)</li> <li>requirements cosmetics preparations registration,</li> <li>Pharmaceutical classification of cosmetic preparations <ul style="list-style-type: none"> <li>cosmetic solutions and oils</li> <li>cosmetic suspensions and foams</li> <li>Cosmetic emulsions</li> <li>Cosmetics solids and semisolids</li> </ul> </li> </ul>	1	2
2	<b>Skin-care cosmetic products</b>	a1, a2, a3, a4, b2, b3, b4, b5	agents, formulations, method of preparations, examples of : a) Anti-wrinkle or anti-aging products including face-masks b) Demulcents and moisturizing products c) Anti-acne products d) Skin- tanning products e) Skin-whitening products f) Hygienic and baby care products	3	6
3	<b>Make-up and removing make-up products:</b>	a1, a2, a3, a4, b2, b3, b4, b5	agents,formulations, method of preparations: a) Lipsticks b) pencils c) Make up powder d)Make up removing products	2	4
Mid-term exam				1	2
4	<b>Bath and cleansing products</b>	a1, a2, a3, a4, b2, b3, b4, b5	agents,formulations, method of preparations: c) Shampoos d) Soaps	1	2



5	<p>aim of Pharmacy Bachelor</p> <ul style="list-style-type: none"> <li><b>Hair care products</b></li> </ul>	a1, a2, a3, a4, b2, b3, b4, b5	<p>agents,formulations, method of preparations:</p> <p>a) hair tints (coloring) and bleaches (discoloring),</p> <p>b) conditioning products for waving, straightening and fixing,</p> <p>c) Depilatories (hair removals).</p> <p>d) hair cleansing products (lotions, powders, shampoo)</p> <p>e) Shaving products (creams, foams, lotions, etc.).</p>	2	4
	<b>Pleasantly Odorants</b>	a1, a2, a3, a4, b2, b3, b4, b5	<p>agents,formulations, method of preparations:</p> <p>d) Perfumes</p> <p>e) toilet waters</p> <p>f) eau de Colog.</p>	2	4
	<b>Oral and dental hygiene products</b>	a1, a2, a3, a4, b2, b3, b4, b5	<p>agents,formulations, method of preparations:</p> <p>a) Toothpaste</p> <p>b) Mouthwashes</p> <p>c) Dental gels</p>	2	4
	<b>Course Review</b>	a1, a2, a3, a4, b2, b3, b4, b5	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	5 Units

**B - Practical Aspect:**



Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	Introduction to lab: list of experiments, how to report, etc	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2.	preparation of anti-aging skin creams, ant-acne dermatological form.	2	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
3.	preparation of lipsticks	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4.	preparation of antiseptic soap	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
5.	preparation of antidandruff shampoo	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
6.	preparation of hair nutrient oil	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
7.	preparation of after-shaving product	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
8.	preparation of perfumes	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
9.	preparation of toothpaste	1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
10.	preparation of dental gel		2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
PRACTICAL EXAM		1	2	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## VI. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VII. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to present a search report supported with images on 5 trade names (commercial preparations) of the studied cosmetic preparations	c5, c6, d4	4-13	3
2	<b>Group</b> :every group is assigned to present an illustrating videos on lab. And industrial preparation of 3 types of cosmetic preparations	c5, c6, d1, d4	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, a3, b2, b3, b4, b5
2	Assignments (1 + 2)	4, 14	5	5	c5, c6, d1, d4
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b3
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a3, b2, b3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, b2, b3, b4, b5
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b6
6	Practical exam (practical)	14	20	20	b1, b6, c1, c2, c3, c4, c6, d1, d2, d3
Total			40	40 %	



## IX. Learning Resources

### 1- Required Textbook(s) ( maximum two ).

4. Hans Mollet, Arnold Grubenmann. Formulation Technology: Emulsions, Suspensions, Solid Forms, 2001 Wiley-VCH Verlag, Wells.
5. Ernest W. Flick. Cosmetic and toiletry formulations, 1996, Noyes Publications

### 2- Essential References.

6. Saraf. Cosmetics
7. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone, UK
8. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## X. Course Policies:

5.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
6.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
7.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
8.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.





## Course Specification

### CLINICAL PHARMACY II

I. Course Identification and General Information:							
1.	Course Title:	CLINICAL PHARMACYII					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 1ST ) semester					
5.	Pre –requisite (if any):	<ul style="list-style-type: none"><li>• Pharmacology I , II&amp; III</li><li>• Clinical pharmacy I</li></ul>					
6.	Co –requisite (if any):	None					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course is designed to provide the students with essential knowledge and skills necessary to practice clinical pharmaceutical services to in-patients and to study of selected medical cases.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Identify knowledge and skills required to practice clinical pharmacy in health care facilities.
2.		a2. Explicit the pharmaceutical care services offered by clinical pharmacists to patients in health care facilities.
3.	A4	a3. Comprehend his/her role as a pharmacist in offering clinical pharmaceutical care services to patients in health care facilities and to practice clinical trials.
4.	B1	b1. Express investigational data using abbreviations.
5.		b2. Interpret clinical features, lab. and instrumental investigations data used in diagnosis of diseases and data of patient medical records.
6.	B3	b3. Relate between investigational data and drug therapy required or applied
7.		b4. Design a therapeutic regimen (plan) for treatment of diseases based on standard protocols and patient case in particular for specific group of patients including pediatrics, geriatrics, pregnant and lactating women.
8.	B4	b5 . Assess the drug therapy regimen applied to patients.
9.		b6. Select alternative drugs to solve drug therapy failure.
10.	C2	c1. Monitor drug therapy applied to inpatients.
11.		c2. Determine the reason of drug therapy failure.
12.		c3. Educate patients about optimal drug use and advice how to limit risk factors and avoid adverse effects related to pharmaceuticals.
13.	C4	c4 .Search efficiently for information using documented and electronic sources of information.
14.		c5. Present and report his/her works correctly using appropriate writing rules and technologies media.
15.	D1	d1. Work successfully in team-activities.
16.	D2	d2. Show respect to life and commit to community serving.
17.	D3	d3. Communicate effectively and cooperate with colleagues.
18.	D4	d4. Demonstrate the ability of time management, self-learning & problem solving skills



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam , Attendance, assignment
b3	Lecture	Written exam , Attendance
b4	Lecture, feed-back learning	Written exam , Attendance, assignment
b5, b6	Lecture, feed-back learning	Written exam , Attendance, quizzes

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2	lecture, feed-back learning	Written exam , Attendance, assignment
c3	lecture	Written exam , Attendance
c4	feed-back learning, Group-project	Assignments
c5	Feed-back learning	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>skills of Assessment of drug therapy(drug therapy monitoring DTM)</b>	a1, a2, a3, b1, b2, b3, b5, b6, c1, c2, c3, d2	<ul style="list-style-type: none"> <li>Objectives</li> <li>patients need DTM</li> <li>methods</li> <li>steps of DTM</li> <li>How to study case of DTM ?</li> <li>Examples of solved case studies</li> <li>determination the source of the drug therapy problem</li> </ul>	2	4
2	<b>Skills of case study and designing therapeutic regimen</b>	a1, a2, a3, b1, b2, b3, b4, b6, c3, d2	<ul style="list-style-type: none"> <li>How to study case ? : Data required</li> <li>Examples of solved case studies data and Information of the case required</li> <li>selection of drugs</li> </ul>	2	4
3	<b>Case study I (CVS diseases)</b>		<ul style="list-style-type: none"> <li>Hypertension</li> <li>Angina &amp; Myocardial infarction</li> <li>Congestive heart failure</li> </ul>	3	6
	<ul style="list-style-type: none"> <li>mid-term exam</li> </ul>			1	2
4	<b>Case study II (Respiratory disorders)</b>		<ul style="list-style-type: none"> <li>Bronchial asthma</li> </ul>	1	2
5	<b>Case study III (Alimentary disorders)</b>		<ul style="list-style-type: none"> <li>Peptic ulcer</li> <li>Irritable bowel syndrome</li> </ul>	2	4
6	<b>Case study III (Blood disorders)</b>		<ul style="list-style-type: none"> <li>Anemia</li> <li>Thalassemia</li> <li>Blood coagulation disorders</li> </ul>	3	6
<b>Course Review</b>		a1, a2, a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve MCQs provided by the teacher . The questions should focus on interpretation of investigational data, monitoring of drug therapy, designing a therapeutic plan , determination source of drug therapy failure, drug selection	b1, b2, c4, c5,	4-13	6
2	<b>Group</b> : each group of students will be assigned to solve one case provided by the teacher.	b1, b2, c1, c2, c4, c5, d1, d3,	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, , a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2
2	Assignments (1 + 2)	4, 14	10	10	b1, b2, c1, c2, c4, c5, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	5	5	b5, b6
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, , a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, , a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( minimum two ).

1. Karen J. Tietze. Clinical skills for pharmacists : A Patient-Focused Approach, 2012, Elsevier Inc.
2. James M. Ritter , A text book of clinical pharmacology and therapeutics, 2008, HodderArn

### 2- Essential References.

1. Joseph T. Diprio, Encyclopaedia of clinical pharmacy, 2003, Marcel Dekker.
2. Widmann. Good clinical interpretation of laboratory tests

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of CLINICAL PHARMACY II

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
<p>The course is designed to provide the students with essential knowledge and skills necessary to practice clinical pharmaceutical services to in-patients and to study of selected medical cases.</p>





### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Identify knowledge and skills required to practice clinical pharmacy in health care facilities.
2.		a2. Explicit the pharmaceutical care services offered by clinical pharmacists to patients in health care facilities.
3.	A4	a3. Comprehend his/her role as a pharmacist in offering clinical pharmaceutical care services to patients in health care facilities and to practice clinical trials.
4.	B1	b1. Express investigational data using abbreviations.
5.		b2. Interpret clinical features, lab. and instrumental investigations data used in diagnosis of diseases and data of patient medical records.
6.	B3	b3. Relate between investigational data and drug therapy required or applied
7.		b4. Design a therapeutic regimen (plan) for treatment of diseases based on standard protocols and patient case in particular for specific group of patients including pediatrics, geriatrics, pregnant and lactating women.
8.	B4	b5 . Assess the drug therapy regimen applied to patients.
9.		b6. Select alternative drugs to solve drug therapy failure.
10.	C2	c1. Monitor drug therapy applied to inpatients.
11.		c2. Determine the reason of drug therapy failure.
12.		c3. Educate patients about optimal drug use and advice how to limit risk factors and avoid adverse effects related to pharmaceuticals.
13.	C4	c4 .Search efficiently for information using documented and electronic sources of information.
14.		c5. Present and report his/her works correctly using appropriate writing rules and technologies media.
15.	D1	d1. Work successfully in team-activities.
16.	D2	d2. Show respect to life and commit to community serving.
17.	D3	d3. Communicate effectively and cooperate with colleagues.
18.	D4	d4. Demonstrate the ability of time management, self-learning & problem solving skills



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture, feed-back learning	Written exam , Attendance, assignment
b3	Lecture	Written exam , Attendance
b4	Lecture, feed-back learning	Written exam , Attendance, assignment
b5, b6	Lecture, feed-back learning	Written exam , Attendance, quizzes

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 , c2	lecture, feed-back learning	Written exam , Attendance, assignment
c3	lecture	Written exam , Attendance
c4	feed-back learning, Group-project	Assignments
c5	Feed-back learning	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments

## IV. Course Content:

O rd er	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
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1	<b>skills of Assessment of drug therapy(drug therapy monitoring DTM)</b>	a1, a2, a3, b1, b2, b3, b5, b6, c1, c2, c3, d2	<ul style="list-style-type: none"> <li>Objectives</li> <li>patients need DTM</li> <li>methods</li> <li>steps of DTM</li> <li>How to study case of DTM ?</li> <li>Examples of solved case studies</li> <li>determination the source of the drug therapy problem</li> </ul>	2	4
2	<b>Skills of case study and designing therapeutic regimen</b>	a1, a2, a3, b1, b2, b3, b4, b6, c3, d2	<ul style="list-style-type: none"> <li>How to study case ? : Data required</li> <li>Examples of solved case studies data and Information of the case required</li> <li>selection of drugs</li> </ul>	2	4
3	<b>Case study I (CVS diseases)</b>	a1, a2, a3, b1, b2, b3, b4, b6, c3, d2	<ul style="list-style-type: none"> <li>Hypertension</li> <li>Angina &amp; Myocardial infarction</li> <li>Congestive heart failure</li> </ul>	3	6
	• mid-term exam			1	2
4	<b>Case study II (Respiratory disorders)</b>	a1, a2, a3, b1, b2, b3, b4, b6, c3, d2	<ul style="list-style-type: none"> <li>Bronchial asthma</li> </ul>	1	2
5	<b>Case study III (Alimentary disorders)</b>	a1, a2, a3, b1, b2, b3, b4, b6, c3, d2	<ul style="list-style-type: none"> <li>Peptic ulcer</li> <li>Irritable bowel syndrome</li> </ul>	2	4
6	<b>Case study III (Blood disorders)</b>	a1, a2, a3, b1, b2, b3, b4, b6, c3, d2	<ul style="list-style-type: none"> <li>Anemia</li> <li>Thalassemia</li> <li>Blood coagulation disorders</li> </ul>	3	6
<b>Course Review</b>		a1, a2, a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.  
The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve MCQs provided by the teacher . The questions should focus on interpretation of investigational data, monitoring of drug therapy, designing a therapeutic plan , determination source of drug therapy failure, drug selection	b1, b2, c4, c5,	4-13	6
2	<b>Group</b> : each group of students will be assigned to solve one case provided by the teacher.	b1, b2, c1, c2, c4, c5, d1, d3,	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, , a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2
2	Assignments (1 + 2)	4, 14	10	10	b1, b2, c1, c2, c4, c5, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	5	5	b5, b6
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, , a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, , a3, b1, b2, b3, b5, d2, d1, d3, d4, c1, c2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( minimum two ).

1. Karen J. Tietze. Clinical skills for pharmacists : A Patient-Focused Approach, 2012, Elsevier Inc.
2. James M. Ritter , A text book of clinical pharmacology and therapeutics, 2008, HodderArn

### 2- Essential References.

1. Joseph T. Diprio, Encyclopaedia of clinical pharmacy, 2003, Marcel Dekker.
2. Widmann. Good clinical interpretation of laboratory tests

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### GRADDUATION RESEARCH

I. Course Identification and General Information:							
1.	Course Title	GRADUATION RESEARCH					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		-	1	-	3		-
4.	Study level/ semester at which this course is offered:	( Fifth ) Year – ( 2 <sup>ND</sup> ) semester					
5.	Pre –requisite (if any):	• All specific program courses + Biostatistics					
6.	Co –requisite (if any):	• None					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course is designed to provide the students skills of practicing scientific research



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	B1	b1. Interpret data comes of experimental researches.
2.	B2	b2. Solve problems and find alternatives .
3.	B3	b3. Relate between conclusions&results.
4.	B4	b4. Make conclusions of their experimentations.
5.	C2	c1. Apply knowledge and skills of pharmacy in practicing scientific researches.
6.	C4	c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
7.	D1	d1. Work successfully in team-activities.
8.	D2	d2. Practice contemporary pharmacy in accordance with professional, legal and ethical standards.
9.	D3	d3. Communicate effectively and cooperate with colleagues.
10.	D4	d4. Demonstrate the ability of time management, self-learning and problem-solving skills





## 2. Alignment CILOs to teaching strategies and assessment strategies

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	feed-back learning, Group project	Graduation project assessment (committee assessment)

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c2, c4	feed-back learning, Group project	Graduation project assessment (committee assessment)

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3, d4	Seminar, feed-back learning, Group project	Graduation project assessment (Supervisor assessment)



#### IV. Course Content:

- Each 4-7 students group is assigned to do an experimentation research supervised by a supervisor of the department teaching staff or outside the college.
- The topic of research can be proposed by :
  - The supervisor
  - Or the students after supervisor acceptance
- The topic must be approved by the department council and the college council
- Experiments are carried out in the college laboratories and if necessary outside the college
- The department and the college provide the students with necessary instruments and materials
- The research is to be carried out with the period of the term ( 16 weeks) and must be delivered to the department within that period
- The department propose the name of committee members to the college council . The committee will discuss and judge the research validation as described below in the assessment schedule .

#### V. Teaching strategies of the course:

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



## VI. Schedule of Assessment Tasks for Students During the Semester

Each project will be assessed by a committee of three member as follows

Items	Weight
Project supervisor	70 %
Internal examiner : a member of the department teaching stuff.	15 %
external examiner : a qualified external examiner (either from other departments of the college or from another university)	15 %
<b>Total</b>	<b>100</b>

### Assessment of the project by the project supervisor

Items	Mark
Attendance	35
Attitude and collaboration	35
<b>Total</b>	<b>70</b>

### Assessment of the project by the internal examiner

Items	Mark <sup>1</sup>
Research methodology	5
Research writing	5
Presentation	2
Discussion	3
<b>Total</b>	<b>15</b>

<sup>1</sup>: The whole students team of the projects will be assessed as one unit

### Assessment of the project by the external examiner

Items	Mark <sup>1</sup>
Research methodology	5
Research writing	5
Presentation	2
Discussion	3
<b>Total</b>	<b>15</b>

<sup>1</sup>: The whole students team of the projects will be assessed as one unit



## VII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Variable
<b>2- Essential References.</b>
2. Variable
<b>3- Electronic Materials and Web Sites etc.</b>
Variable

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of GRADUATION RESEARCH PROJECT

### I. - Information about Faculty Member Responsible for the Course:

Name of Faculty Member		Office Hours					
Location & Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

### III. Course Description:

The course is designed to provide the students skills of practicing scientific research

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 3. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	B1	b1. Interpret data comes of experimental researches.



2.	B2	b2. Solve problems and find alternatives .
3.	B3	b3. Relate between conclusions&results.
4.	B4	b4. Make conclusions of their experimentations.
5.	C2	c1. Apply knowledge and skills of pharmacy in practicing scientific researches.
6.	C4	c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
7.	D1	d1. Work successfully in team-activities.
8.	D2	d2. Practice contemporary pharmacy in accordance with professional, legal and ethical standards.
9.	D3	d3. Communicate effectively and cooperate with colleagues.
10.	D4	d4. Demonstrate the ability of time management, self-learning and problem-solving skills

## 1. Alignment CILOs to teaching strategies and assessment strategies

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
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b1, b2, b3, b4	feed-back learning, Group project	Graduation project assessment (committee assessment)
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c2, c4	feed-back learning, Group project	Graduation project assessment (committee assessment)
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d2, d3, d4	Seminar, feed-back learning, Group project	Graduation project assessment (Supervisor assessment)

#### IV. Course Content:

- Each 4-7 students group is assigned to do an experimentation research supervised by a supervisor of the department teaching staff or outside the college.
- The topic of research can be proposed by :
  - The supervisor
  - Or the students after supervisor acceptance
- The topic must be approved by the department council and the college council
- Experiments are carried out in the college laboratories and if necessary outside the college
- The department and the college provide the students with necessary instruments and materials
- The research is to be carried out with the period of the term ( 16 weeks) and must be delivered to the department within that period
- The department propose the name of committee members to the college council . The committee will discuss and judge the research validation as described below in the assessment schedule .



## V. Teaching strategies of the course:

**Feed-back learning:** students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects:** students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Schedule of Assessment Tasks for Students

Each project will be assessed by a committee of three member as follows

Items	Weight
Project supervisor	70 %
Internal examiner : a member of the department teaching stuff.	15 %
external examiner : a qualified external examiner (either from other departments of the college or from another university)	15 %
<b>Total</b>	<b>100</b>

### Assessment of the project by the project supervisor

Items	Mark
Attendance	35
Attitude and collaboration	35
<b>Total</b>	<b>70</b>

### Assessment of the project by the internal examiner

Items	Mark <sup>1</sup>
Research methodology	5
Research writing	5
Presentation	2
Discussion	3
<b>Total</b>	<b>15</b>

<sup>1</sup>: The whole students team of the projects will be assessed as one unit

### Assessment of the project by the external examiner

Items	Mark <sup>1</sup>
Research methodology	5





Research writing	5
Presentation	2
Discussion	3
<b>Total</b>	<b>15</b>

<sup>1</sup>: The whole students team of the projects will be assessed as one unit

## VII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

3. Variable

### 2- Essential References.

4. Variable

### 3- Electronic Materials and Web Sites etc.

Variable

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### field training II

I. Course Identification and General Information:							
1.	Course Title:	field training II					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		-	-	-			2
4.	Study level/ semester at which this course is offered:	Fourth year/2 <sup>nd</sup> -semester					
5.	Pre –requisite (if any):	Field training I and all courses of the first four years					
6.	Co –requisite (if any):	Nil					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	The Community and Hospital Pharmacies					
10	Prepared By:	Prof. Dr. Ali Gamal Al-kaf Reviewed by prof. Dr. Jalal Hamoud Al-qadasi					
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

## II. Course Description:

This course offers all the knowledge and experience to pharmacy students who want to work in community or hospital pharmacies as their future job.



## I. Intended learning outcomes (ILOs) of the course:

**At the end of this course, the students will be able to:**

1. Familiar with the requirements and conditions of the storage for pharmaceuticals in the pharmacy and the process of ordering, receiving, pricing and returning medication products from wholesalers.
2. Know factors that should drive the development of value-added pharmacy services
3. Correlate pharmaceutical, biomedical and clinical knowledge to patient care.
4. Properly, interpret the pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.
5. Retrieve drug information on key assigned concepts (brand/generic name, use, usual dosage form(s), route of administration, common adverse drug reactions, and major patient counseling points).
6. Select appropriate management strategy for patients in different medical situations.
7. Review a patient's medication profile to detect medication allergies, correct doses, duplicate medications, and important drug interactions.
8. Provide level-appropriate counseling to patients, physician and/or other caregivers including proper instructions for safe and effective use.
9. Prescribe OTC medications for an optimal therapy.
10. Use pharmacy systems and technology that improve patient safety, pharmacy inventory management, drug / product storage, and medication distribution.
11. Interact effectively with patients, the public and health care professionals; including communication, interpretation and presentation of pharmaceutical information and data using appropriate listening, verbal, nonverbal, and written communication skills.
12. Perform according to professional and moral ethical codes and approaches considering laws of human rights as well as legal and safety guidelines.
13. Improve the pharmacist thinking, decision making and improve his problem solving abilities.
14. Manage time effectively.

## 1- Intended learning outcomes (ILOs) of the course:

### (A) Knowledge and Understanding:

Alignment Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **Knowledge and Understanding.**



Program Intended Learning Outcomes (Sub- <b>PILOs</b> ) in: <b>Knowledge and Understanding</b>		Course Intended Learning Outcomes ( <b>CILOs</b> ) in: <b>Knowledge and Understanding</b>	
After completing this program, students would be able to:		After participating in the course, students would be able to:	
<b>A4-</b>	Recognize the basis of drug therapy (designing and monitoring) and its cost-effectiveness and the alternative therapy methods.	<b>a1-</b>	Familiar with the requirements and conditions of the storage for pharmaceuticals in the pharmacy and the process of ordering, receiving, pricing and returning medication products from wholesalers.
		<b>a2-</b>	Know factors that should drive the development of value-added pharmacy services
<b>Teaching And Assessment Methods For Achieving Learning Outcomes:</b>			
<b>Alignment Learning Outcomes of Knowledge and Understanding to Teaching and Assessment Methods:</b>			
Course Intended Learning Outcomes ( <b>CILOs</b> ) in Knowledge and Understanding After participating in the course, students would be able to:		Teaching strategies/methods to be used	Methods of assessment
<b>a1-</b>	Familiar with the requirements and conditions of the storage for pharmaceuticals in the pharmacy and the process of ordering, receiving, pricing and returning medication products from wholesalers.	<ul style="list-style-type: none"> <li>Practical Tutorials</li> <li>Computer- aided learning</li> </ul>	<ul style="list-style-type: none"> <li>✓ Objective Structured Practice Exam</li> <li>✓ Final Written Examinations</li> <li>✓ Oral Examinations</li> <li>✓ Written Reports</li> </ul>
<b>a2-</b>	Know factors that should drive the development of value-added pharmacy services.		

## (B) Intellectual Skills:

Alignment Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: <b>Intellectual skills</b>			
Program Intended Learning Outcomes (Sub- <b>PILOs</b> ) in Intellectual skills		Course Intended Learning Outcomes ( <b>CILOs</b> ) of Intellectual Skills	
After completing this program, students would be able to:		After participating in the course, students would be able to:	
<b>B1-</b>	B1. Use various logic mental processes such as calculation, explanation, description, conclusion, and others in	<b>b1-</b>	Correlate pharmaceutical, biomedical and clinical knowledge to patient care.



	dealing with various phenomena/problems related to pharmacy works.		
<b>B2-</b>	Compare, differentiate and distinguish between related entities, phenomena and concepts and classify various entities based on certain properties.	<b>b2-</b>	Properly, interpret the pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.
		<b>b3-</b>	Retrieve drug information on key assigned concepts (brand/generic name, use, usual dosage form(s), route of administration, common adverse drug reactions, and major patient counseling points).
		<b>b4-</b>	Select appropriate management strategy for patients in different medical situations.

### Teaching And Assessment Methods For Achieving Learning Outcomes:

#### Alignment Learning Outcomes of Intellectual Skills to Teaching Methods and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Intellectual Skills. After participating in the course, students would be able to:		Teaching strategies/methods to be used.	Methods of assessment
<b>b1-</b>	Correlate pharmaceutical, biomedical and clinical knowledge to patient care.	<ul style="list-style-type: none"> <li>Practical Tutorials</li> <li>Problem-based learning</li> <li>Direct Patient Contact</li> <li>Role Modeling</li> </ul>	<ul style="list-style-type: none"> <li>✓ Objective Structured Practice Exam</li> <li>✓ Written Reports</li> <li>✓ Final Written Examinations</li> <li>✓ Oral Examinations</li> </ul>
<b>b2-</b>	Properly, interpret the pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.		
<b>b3-</b>	Retrieve drug information on key assigned concepts (brand/generic name, use, usual dosage form(s), route of administration, common adverse drug reactions, and major patient counseling points).		
<b>b4-</b>	Select appropriate management strategy for patients in different medical situations.		

### (C) Professional and Practical Skills.

#### Alignment Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Professional and Practical Skills

Program Intended Learning Outcomes (Sub- PILOs) in Professional and	Course Intended Learning Outcomes (CILOs) in Professional and Practical
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Practical Skills		Skills	
After completing this program, students would be able to:		After participating in the course, students would be able to:	
C1-	Commit to standard operation procedures (SOPs) and safety criteria during practicing pharmacy works in Laboratories, hospitals, pharmacies and drug factories.	c1-	Review a patient's medication profile to detect medication allergies, correct doses, duplicate medications, and important drug interactions.
		c2-	Provide level-appropriate counseling to patients, physician and/or other caregivers including proper instructions for safe and effective use.
		c3-	Prescribe OTC medications for an optimal therapy.
		c4-	Use pharmacy systems and technology that improve patient safety, pharmacy inventory management, drug / product storage, and medication distribution.

### Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment Learning Outcomes of Professional and Practical Skills to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills After participating in the course, students would be able to:		Teaching strategies/methods to be used	Methods of assessment
c1-	Review a patient's medication profile to detect medication allergies, correct doses, duplicate medications, and important drug interactions.	<ul style="list-style-type: none"> <li>Practical Tutorials</li> <li>Direct Patient Contact</li> <li>Role Modeling</li> <li>Problem-based learning</li> <li>Computer- aided learning</li> </ul>	<ul style="list-style-type: none"> <li>✓ Objective Structured Practice Exam</li> <li>✓ Oral Examinations</li> <li>✓ Final Written examinations</li> <li>✓ Written Reports</li> <li>✓ Practice Exam</li> </ul>
c2-	Provide level-appropriate counseling to patients, physician and/or other caregivers including proper instructions for safe and effective use.		
c3-	Prescribe OTC medications for an optimal therapy.		
c4-	Use pharmacy systems and technology that improve patient safety, pharmacy inventory management, drug / product storage, and medication distribution.		

### (D) General / Transferable skills .



Program Intended Learning Outcomes (PILOs) in General / Transferable skills			
After completing this program, students would be able to:			
D1-	Share successfully in teamwork & reporting activities.	d1-	Interact effectively with patients, the public and health care professionals; including communication, interpretation and presentation of pharmaceutical information and data using appropriate listening, verbal, nonverbal, and written communication skills.
D2-	Show respect to life and commit to community serving	d2-	Perform according to professional and moral ethical codes and approaches considering laws of human rights as well as legal and safety guidelines.
D3-	Communicate effectively with his/her colleagues,	d3-	Improve the pharmacist thinking, decision making and improve his problem solving abilities.
		d4-	Manage time effectively.
Teaching And Assessment Methods For Achieving Learning Outcomes:			
Alignment Learning Outcomes of General and Transferable skills to Teaching and Assessment Methods.			
Course Intended Learning Outcomes (CILOs) in General and Transferable Skills		Teaching strategies/methods to be used.	Methods of assessment
After participating in the course, students would be able to:			
d1-	Interact effectively with patients, the public and health care professionals; including communication, interpretation and presentation of pharmaceutical information and data using appropriate listening, verbal, nonverbal, and written communication skills.	<ul style="list-style-type: none"><li>▪ Practical Tutorials</li><li>▪ Direct Patient Contact</li><li>▪ Role Modeling</li><li>▪ Problem-based learning</li><li>▪ Computer- aided learning</li></ul>	✓ Objective Structured Practice Exam
d2-	Perform according to professional and moral ethical codes and approaches considering laws of human rights as well as legal and safety guidelines.		✓ Oral Examinations
d3-	Improve the pharmacist thinking, decision making and improve his problem solving abilities.		✓ Final Written examinations
d4-	Manage time effectively.		✓ Written Reports ✓ Practice Exam



## V. Course Contents:

No.	Units / Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact Hours
1.	<b>Drugs Used in Gastrointestinal Diseases:</b>	a.1 , b.1- b.4, c.1- c.4, d.1- d.4	Drugs used in pharmacotherapy peptic ulcer, GERD, flatulence, vomiting, diarrhea, constipation	1	25
2.	<b>Drugs Used in Gastrointestinal Diseases:</b>	a.1 , b.1- b.4, c.1- c.4, d.1- d.4	, hemorrhoids, visceral spasms, inflammatory bowel disease, gallstones, hepatic encephalopathy and esophageal varices	1	25
3.	<b>Microbial Chemotherapy:</b>	a.1 , b.1- b.4, c.1- c.4, d.1- d.4	Antibacterial drugs	1	25
			Antifungal and antiviral drugs	1	25
			Antiprotozoal drugs, anthelmintics, antiseptics and disinfectants	1	25
4.	<b>Chemotherapy of Cancer</b>	a.1, b.1- b.4, c.1- c.4, d.1- d.4	Alkylating agents, anti-metabolites, vinca alkaloids, cytotoxic antibiotics, hormonal agents, and others	1	25
5.	<b>Immunologic Drugs</b>	a.1, b.1- b.4, c.1- c.4, d.1- d.4	Vaccines and Antibodies	1	25
6.	<b>Fluids and Electrolytes</b>	a.1, b.1- b.4, c.1- c.4, d.1- d.4	Blood Plasma, Protein Substrates, Plasma Protein Fractions, Energy Substrates, Plasma Expanders, Intravenous Replacement Solutions	1	25
7.	<b>Miscellaneous Drugs</b>	a.1, b.1- b.4, c.1- c.4, d.1- d.4	Ophthalmic, skin, dental preparations, drugs for obesity and erectile dysfunction, OTC drugs, diagnostic drugs	1	25
8.	<b>Cosmetics</b>	a.1, b.1- b.2, b.4, c.1- c.4, d.1- d.4	Different kinds of cosmetic substances	1	25
9.	<b>Parapharmaceuticals, Home Diagnostics, and Medical Devices</b>	a.1, b.1- b.2, b.4, c.1- c.4, d.1- d.4	Ambulatory aids, bathroom equipment, blood pressure monitors, heat and cold therapy, home diagnostic aids, hospital beds and accessories, incontinence products, orthopedic braces and surgical fittings,	1	25





			ostomy appliances and accessories, respiratory equipment, thermometers, urinary catheters		
10.	<b>Vitamins, Minerals and Dietary Supplements</b>	<b>a.1, b.1- b.4, c.1- c.4, d.1- d.4</b>	Fat soluble vitamins and water soluble vitamins, drug-vitamin interactions, minerals, dietary supplements	1	25
<b>Number of Weeks /and Units Per Semester</b>					<b>300</b>

## VI. Teaching strategies of the course:

1. Practical Tutorials (small group discussion)
2. Computer- based learning
3. Problem-based learning
4. Role Modeling
5. Direct Patient Contact

## VII. Assignments:

Assignments	Aligned CILOs (symbols)	Week Due	Mark
Written Reports	a.1, b.1, b3-b.4, c.1- c.4, d.1, d.3	2 <sup>nd</sup> , 4 <sup>th</sup> , 6 <sup>th</sup> , 8 <sup>th</sup> , 10 <sup>th</sup> , 12 <sup>th</sup> , 14 <sup>th</sup>	10

## VIII. Schedule of Assessment Tasks for Students during the Semester:

No.	Assessment Method	Aligned Course Learning Outcomes	Week Due	Mark	Proportion of Final Assessment
1.	<b>Attendance, Participation and Activity</b>	a.1-a.2, b.1- b.4, c.1- c.4, d.1- d.4	All Weeks	10	20%
2.	<b>Written Reports</b>	a.1, b.1, b3-b.4, c.1- c.4, d.1, d.3	2 <sup>nd</sup> , 4 <sup>th</sup> , 6 <sup>th</sup> , 8 <sup>th</sup> , 10 <sup>th</sup> , 12 <sup>th</sup>	10	



			14 <sup>th</sup>		
3.	<b>Oral Examinations</b>	a.1-a.2, b.1-b.4, c.1-c.3, c.4, d.1- d.4	3 <sup>rd</sup> , 5 <sup>th</sup> , 7 <sup>th</sup> , 11 <sup>th</sup> , 15 <sup>th</sup>	10	10%
4.	<b>Objective Structured Practice Exam</b>	a.1, b.1-b.4, c.1- c.4, d.1- d.4	16 <sup>th</sup>	40	40%
5.	<b>Final Written Examinations</b>	a.1-a.2, b.1- b.4, c.1- c.3, d.3	16 <sup>th</sup>	30	30%
<b>Total</b>				<b>100</b>	<b>100%</b>

## IX. Learning Resources:

### 1- Required Textbook (s) (maximum two).

1. James, E.F, Reynolds, Parfitt, K., 2007, Martindale, "The extra pharmacopeia", 31<sup>st</sup> edition, Royal Pharmaceutical Society, London.
2. Roger Walker, Cate Whittlesea, 2011, Clinical Pharmacy and Therapeutics, 5<sup>th</sup> edition, Elsevier Health Sciences.

**Latest editions of all the suggested books are recommended.**

### 2- Essential References.

1. Remington's, The science and practice of pharmacy, 2000., Philadelphia college of pharmacy and science, 20<sup>th</sup> edition Philadelphia, USA,
2. John P. Rovers, Jay D. Currie, Harry P. Hagel, Randy P. McDonough, Jenelle L. Sobotka. 2003, A practical Guide to pharmaceutical care, 2<sup>nd</sup> edition., APhA Publications.

**Latest editions of all the suggested books are recommended.**

### 3- Electronic Materials and Web Sites etc.

websites:

1. [www.fda.gov](http://www.fda.gov)
2. <http://www.mhra.gov.uk/index.htm>
3. <http://jpet.aspetjournals.org>
4. <http://www.jpharmacol.com>
5. <http://www.sciencedirect.com>
6. <http://www.ncbi.nlm.nih.gov/pubmed>

## IX. Students' Support:



Office Hours/week	Other Procedures (if any)
Two contact hours per week	None

## X. Facilities Required:

<b>1 - Accommodation:</b>	<ul style="list-style-type: none"> <li>- Well-equipped lecture halls with data show facilities, whiteboards, net connection, etc.</li> <li>- Well-equipped laboratories with all required equipment and reagents.</li> </ul>
<b>2 - Computing resources:</b>	<ul style="list-style-type: none"> <li>- Computer laboratory with internet facilities.</li> </ul>

## XI. Course Improvement Processes:

<b>1- Strategies for obtaining student feedback on effectiveness of teaching</b>	
	<ul style="list-style-type: none"> <li>▪ Student-based assessment of the effectiveness of teaching using a questionnaire designed by the Quality Assurance Unit at the end of the semester.</li> <li>▪ Meeting with students and faculty (once per semester).</li> </ul>
<b>2- Other strategies for evaluation of teaching by the instructor or by the department.</b>	
	<ul style="list-style-type: none"> <li>▪ Assessment of the course syllabus and contents by the teachers using a questionnaire designed by the Quality Assurance Unit of the university at the end of the semester.</li> <li>▪ Regular meeting and discussion of the course content between the Head of Department and the teaching staff of the course (for theory and practice).</li> </ul>
<b>3- Processes for improvement of teaching.</b>	
	<ul style="list-style-type: none"> <li>▪ Revision of the course specification and its teaching strategies every three academic years after consideration of all issues raised by the teachers and/or students during regular meetings and discussions.</li> <li>▪ Exploring any possible defects in the course that might be encountered by the teaching staff and their mitigation in subsequent improved versions of course specification.</li> </ul>
<b>4- Processes for verifying standards of students' achievement</b>	
	<ul style="list-style-type: none"> <li>▪ Checking of a sample of students' work by an independent faculty member.</li> <li>▪ Periodic exchange and check marking of a sample of students' assignments with a faculty member from another institution.</li> <li>▪ Adoption of scoring rubrics to assess the students' achievement (both for ongoing or summative assessments).</li> <li>▪ Regular follow-up of laboratory logbooks to assess the practical achievement of students.</li> </ul>
<b>5- Procedures for periodically reviewing of course effectiveness and planning for</b>	



improvement	
	<ul style="list-style-type: none"> <li>Student rating and feedback</li> <li>Peer rating and feedback</li> <li>Regular meeting of the Curriculum Committee of the faculty.</li> </ul>
6- Course development plans	
	<ul style="list-style-type: none"> <li>Conducting regular workshops for the staff for improving their course specification skills.</li> <li>Regular revision of course specification and syllabus items.</li> </ul>

## XII. Course Policies: (including plagiarism, academic honesty, attendance etc)

The University Regulations on academic misconduct will be strictly enforced. Please refer to -----

1	<b>Class Attendance:</b> <ul style="list-style-type: none"> <li>Attendance in all lectures and practical classes are required, except in very emergency circumstances, such as serious illness or death in the family with providing an acceptable documentation approved the university and forwarded by the chairman of the department. Otherwise the absence shall be considered unexcused.</li> <li>In accordance with the university rules, if the percentage of student's absentness exceeds 25 % of the total lectures or practical classes, the student involved shall be disqualified in the final written and practical examination of the course and shall be deemed to have failed in the course.</li> </ul>
2	<b>Tardy:</b> <ul style="list-style-type: none"> <li>Roll will be called in the very beginning of each lecture and practical class. Retardation for more than three weeks without a reasonable excursion, the student involved shall not be allowed to attend the class any longer and consequently shall be considered to be absent.</li> </ul>
3	<b>Exam Attendance/Punctuality:</b> <ul style="list-style-type: none"> <li>It is incumbent on student to report at the examination hall for checking in and rolls calling at least 15 minutes before the commencement of examination.</li> </ul>





	<p>-A student is not allowed to submit answer booklet and leave the examination hall only on or after the passage of the have examination duration (equivalent to the first one hour after the commencement of the examination).</p> <p>-A student who comes late shall not be admitted to the examination hall, only within the first one hour of the examination. Attending after this time, the student will be considered to be missed in the examination and shall be deemed to have failed in the course.</p> <p>When a student misses the final examination due to a legitimate medical problems or death in the family, an acceptable documentation approved by the university medical unit for the excused absentness (hospitals medical reports along with discharge summaries or death certificate) must be provided no later than three weeks and consequently the student shall be disqualified in the examination but with the excused absentness.</p>
4	<p><b>Assignments &amp; Projects:</b></p> <p>- Micro-assignments and practical reports must be submitted for the assessment on or before the due date. If a student does not submit the micro-assignments or practical reports, the student shall be allotted zero marks which will affect the final assessment of the course.</p> <p>-The submission date extension will not be granted only by the consent of the faculty member concerned. In the case of late submission, the student must provide a reasonable explanation to the faculty member.</p> <p>Otherwise 1% of the obtained marks will be subtracted for each late day, including weekends and holidays.</p>
5	<p><b>Cheating:</b></p> <p>-If a student is found cheating in the final and med-term examinations and quizzes(copying from un authorized materials and anther students' work or allowing other students to copy from his/her own work), the student involved shall be disqualified in the examination and shall be deemed to have failed in the course and also suspended from examinations of two more courses.</p> <p>If a student if found engaging in any unauthorized communications (oral,sign,call,etc.), while the examination is in progress or in possessing of any authorized materials or electronic devices before the distribution of examination papers , the student involved shall be disqualified in the examination and shall be deemed to have failed the course.</p>
6	<p><b>Plagiarism:</b></p> <p>- Plagiarism is the presentation of any material (text, data or figures) from any other source in preparation of micro-assignments or practical reports without clear and adequate acknowledgement of the source.</p> <p>- Plagiarism is also the use or copy of other students' work (with, or without payment) to prepare all or part of undertaken micro-assignments or practical reports of work submitted for assessment.</p> <p>All types of plagiarism in are unacceptable and are considered of honest practices. If a student is found using plagiarism in devoted micro-assignments or reports , the student involved shall be subjected to the same penalties as in the case of cheating as already mentioned in the sub-section (5) of the course policies.</p>



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**Other policies:**

- Students must switch off their mobile phones, labtops, electronic devices etc. before entering lecture room or laboratory. If a student is found using these devices while the lecture or practical work is in progress, the student involved shall be expelled out of the class and shall be considered to be absent. Note that students can submit their micro-assignments or practical reports through the e-mail address of the faculty member concerned and should be prudent to keep Photostat or electronic copies of submitted works to guard against an accidental loss.







## Course Specification

### INDUSTRIAL PHARMACY I

I. Course Identification and General Information:					
1.	Course Title:	INDUSTRIAL PHARMACY I			
2.	Course Code & Number:				
3.	Credit hours:	C.H			TOTAL
		Theoretical		P.	
		L.	Tut.	S.	
		2	-	-	2
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( FIRST ) semester			
5.	Pre –requisite (if any):	• Pharmaceutics I , II & III			
6.	Co –requisite (if any):	Pharmacy training			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10.	Prepared By:				
11.	Date of Approval	2015			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of criteria for good manufacturing practice (GMP) and the substantial unit operations during manufacturing of drug products in drug plants.





### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Determine the physicochemical properties of materials (raw, in-process materials) that affect the manufacturing of drug products
2.	A3	a2. Explicit the physical principles of unit operations applied in manufacturing of drug products.
3.	A3	a3. . Discuss the criteria of GMP and the techniques , equipments& machines used for manufacturing of drug products.
4.	A4	a4. Comprehend his/her role as a pharmacist in employment GMP criteria and to operate and supervise unit operations for manufacturing of drug products
5.	B2	b1. Solve problems of production and operation of equipments and machines used for manufacturing drug products.
6.	B2	b2. Classify various equipments& machines and techniques used in unit operations for manufacturing of drug products.
7.	B2	b3. Compare between various techniques used in unit operations for manufacturing of drug products.
8.	B3	b4 .Relate the quality of drug products to employment of GMP criteria.
9.	B3	b5 .Predict the reasons for improper quality of drug products .
10.	B4	b6. Assess the implementing of GMP criteria in a drug plant
11.	B4	b7. Select the best technique for performing a unit operation used for manufacturing of drug products.
12.	C4	c1 .Search efficiently for information using documented and electronic sources of information.
13.	C4	c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Share successfully in team-work.
15.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
16.	D4	d3. Demonstrate the ability of time management , self-learning and problem solving.

#### 2. Alignment CILOs to teaching strategies and assessment strategies



**(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4	Lecture, Feed-back learning	Written exam , Assignments

**(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture, Feed-back learning	Written exam , Assignments, quizzes
b2, b3, b4, b5, b6, b7	Lecture, Feed-back learning	Written exam , Assignments, quizzes

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1,c2	feed-back learning, Group-project	Assignments , Practical assessment (Lab. attendance, reporting, practical exam)

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to industrial pharmacy</b>	a3, a4, d2	<ul style="list-style-type: none"> <li>The need and Significance for large-scale production of drugs</li> <li>history of large scale manufacturing of drug products.</li> <li>Criteria of good manufacturing practice (GMP) based on WHO-GMP guidelines</li> <li>materials of drug plant construction</li> </ul>	2	6
2	<b>General principles of flow and transfer</b>	b1, b5, c1, c2, d1, , d3	a. mass transfer b. fluid flow c. heat transfer	2	6
3	<b>Fundamental premixing unit operations (applied to fluids)</b>	a2, a4	a. fluid clarification <ul style="list-style-type: none"> <li>Filtration</li> <li>Centrifugation</li> </ul> b. Solvent Extraction c. Evaporation d. Distillation	2	6
• MID-TERM EXAM				1	3
5	<b>Fundamental premixing unit operations (applied to solids)</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	a. crystallization b. drying c. particle size reduction (milling) d. particle size enlargement (granulation)	3	9
6	<b>Mixing operation unit</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	a. Solid-solid mixing b. Solid-fluid and fluid-fluid mixing c. Semisolid mixing	2	6
	<b>Filling and packaging Processes</b>		a. Filling of finished product b. packaging.( including types of packaging materials)	2	6
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> Every student is assigned to provide a search-based video-illustrating one operation studied in this course.	a3, c1, c2, d3	4-13	6
2	<b>Group :</b> The teacher will provide the students with a number of problems related to operation and production studied in this course. The student group is assigned to provide technical solutions of one of those problems	b1, b5, c1, c2, d1, d3	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	b1, b5, c1, c2, d1, d3
2	Assignments (1 + 2)	4, 14	10	10	b1, b5, c1, c2, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b4, b5
4	Mid-semester exam of theoretical part ( written exam	7	20	20	b1, b5, c1, c2, d1, d3
5	Final exam of theoretical part ( written exam)	17	60	60	b1, b5, c1, c2, d1, d3
TOTAL			100	100 %	60

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone 2. Lachman, Theory and Practice of Industrial Pharmacy
<b>2- Essential References.</b>
1. Vidya. pharmaceutical industrial management Chandrasekhar. Pharmaceutical engineering 2. Jyothi. pharmaceutical engineering
<b>3- Electronic Materials and Web Sites etc.</b>
• <a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
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Program of Pharmacy Bachelor	
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### INDUSTRIAL PHARMACY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

III. Course Description:
The course deals with the study of criteria for good manufacturing practice (GMP) and the substantial unit operations during manufacturing of drug products in drug plants.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Determine the physicochemical properties of materials (raw, in-process materials) that affect the manufacturing of drug products
2.	A3	a2. Explicit the physical principles of unit operations applied in manufacturing of drug products.
3.	A3	a3. . Discuss the criteria of GMP and the techniques , equipments& machines used for manufacturing of drug products.
4.	A4	a4. Comprehend his/her role as a pharmacist in employment GMP criteria and to operate and supervise unit operations for manufacturing of drug products
5.	B2	b1. Solve problems of production and operation of equipments and machines used for manufacturing drug products.
6.	B2	b2. Classify various equipments& machines and techniques used in unit operations for manufacturing of drug products.
7.	B2	b3. Compare between various techniques used in unit operations for manufacturing of drug products.
8.	B3	b4 .Relate the quality of drug products to employment of GMP criteria.
9.	B3	b5 .Predict the reasons for improper quality of drug products .
10.	B4	b6. Assess the implementing of GMP criteria in a drug plant
11.	B4	b7. Select the best technique for performing a unit operation used for manufacturing of drug products.
12.	C4	c1 .Search efficiently for information using documented and electronic sources of information.
13.	C4	c2. Present and report his/her works correctly using appropriate writing rules and technologies media.
14.	D1	d1. Share successfully in team-work.
15.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
16.	D4	d3. Demonstrate the ability of time management , self-learning and problem solving.

#### 2. Alignment CILOs to teaching strategies and assessment strategies





**(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4	Lecture, Feed-back learning	Written exam , Assignments

**(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture, Feed-back learning	Written exam , Assignments, quizzes
b2, b3, b4, b5, b6, b7	Lecture, Feed-back learning	Written exam , Assignments, quizzes

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1,c2	feed-back learning, Group-project	Assignments , Practical assessment (Lab. attendance, reporting, practical exam)

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to industrial pharmacy</b>	a3, a4, d2	<ul style="list-style-type: none"> <li>The need and Significance for large-scale production of drugs</li> <li>history of large scale manufacturing of drug products.</li> <li>Criteria of good manufacturing practice (GMP) based on WHO-GMP guidelines</li> <li>materials of drug plant construction</li> </ul>	2	6
2	<b>General principles of flow and transfer</b>	b1, b5, c1, c2, d1, , d3	a. mass transfer b. fluid flow c. heat transfer	2	6
3	<b>Fundamental premixing unit operations (applied to fluids)</b>	a2, a4	a. fluid clarification <ul style="list-style-type: none"> <li>Filtration</li> <li>Centrifugation</li> </ul> b. Solvent Extraction c. Evaporation d. Distillation	2	6
• MID-TERM EXAM				1	3
5	<b>Fundamental premixing unit operations (applied to solids)</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	a. crystallization b. drying c. particle size reduction (milling) d. particle size enlargement (granulation)	3	9
6	<b>Mixing operation unit</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	a. Solid-solid mixing b. Solid-fluid and fluid-fluid mixing c. Semisolid mixing	2	6
	<b>Filling and packaging Processes</b>		a. Filling of finished product b. packaging.( including types of packaging materials)	2	6
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3	Review of the course topics by discussion session.	1	2
FINAL - EXAM				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> Every student is assigned to provide a search-based video-illustrating one operation studied in this course.	a3, c1, c2, d3	4-13	6
2	<b>Group :</b> The teacher will provide the students with a number of problems related to operation and production studied in this course. The student group is assigned to provide technical solutions of one of those problems	b1, b5, c1, c2, d1, d3	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester



No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	b1, b5, c1, c2, d1, d3
2	Assignments (1 + 2)	4, 14	10	10	b1, b5, c1, c2, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b4, b5
4	Mid-semester exam of theoretical part ( written exam	7	20	20	b1, b5, c1, c2, d1, d3
5	Final exam of theoretical part ( written exam)	17	60	60	b1, b5, c1, c2, d1, d3
TOTAL			100	100 %	60

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Aulton M.E., Pharmaceutics: the science of dosage form design, 2002, Churchill Livingstone
2. Lachman, Theory and Practice of Industrial Pharmacy

### 2- Essential References.

1. Vidya. pharmaceutical industrial management Chandrasekhar. Pharmaceutical engineering
2. Jyothi. pharmaceutical engineering

### 3- Electronic Materials and Web Sites etc.

- [www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1. **Class Attendance:** At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam



Program of Pharmacy Bachelor	
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## **Course Specification of Industrial Pharmacy II**

I. Course Identification and General Information:						
1	Course Title:	Industrial Pharmacy II				
2	Course Number & Code:					
3	Credit hours:3hrs	C.H				Total
		Theoretical	Practical	Training	Seminar	
		2				
4	Study level / semester at which course is offered:	( FIFTH ) Year – ( 2ND ) semester				
5	Pre –requisite (if any):	Industrial Pharmacy I				
6	Co –requisite (if any):	none				
7	Programs in which course is offered:	Bachelor of pharmacy				
8	Language of teaching the course:	English				
9	Department in which course is offered:	Pharmaceutics and Industrial Pharmacy				
10	Location of teaching the course:	Alyemen university				
11	Prepared by:					
12	Date of approval:	2015				

### **II. Course description:**

Course provide students with the necessary knowledge in the area of pharmaceutical technology, and to help them to understand the fundamentals and importance of the unit operations in the manufacture of dosage forms such as mixing, drying, milling and particle size analysis

#### **I. أهداف المقرر Course Aims :**

The course aims at enabling students to:

- 1- evaluate the production facilities regarding the GMP and QC properties in pharmaceutical industry
- 2- operate the equipments that used for distillation, crystallization, filtration and air purification in pharmaceutical industry
- 3- Select the best equipment and/or operational line to perform pharmaceutical products



- 4- apply pharmaceutical technology as regards to the GMP, GLP,  
5- Maintaining the pharmaceutical instrument and equipment efficiently and solving the encounter problem in pharmaceutical manufacturing processes.

### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A5	a1.Distinguish appropriate good manufacturing practice (GMP) and Quality Control (QC) criteria to aseptic and sterile production facilities and other pharmaceutical industry
2.	A5	a2.Identify the principles of quality assurance (QA) in education and of quality assurance of pharmaceutical processes and products.
3.	A5	a3.Recall the principles of various instruments and techniques including manufacturing, packaging, labeling and storing processes in pharmaceutical industry.
4.	A5	a4.Describe the equipment's of filtration, crystallization, distillation and air purification used in industrial pharmacy with their operation and applications.
5.	B1	b1. Recommend good manufacturing practice (GMP), good laboratory practice (GLP), good clinical practice (GCP) and good safety practice (GSP) guidelines in pharmaceutical technology, pharmaceutical research and pharmacy practice.
6.	B2	b2. Assess the relationship between equipment design and product characteristics
7.	B1	b3 Select the best equipment and/or operational line to perform pharmaceutical operation..
8.	B1	b4.Diagrammatically design the studied equipments for each operation
9.	C1	c1.Manage pharmaceutical instruments and equipment safely and efficiently and solve commonly encountered problems in pharmaceutical manufacturing processes
10.	C3	c2.Collect data about different equipment used in pharmaceutical industry and their operation.
11.	C3	c3.Conduct research studies and analyze results.
12.	D4	d1.Plan strategies to fulfill workplace pharmaceutical needs
13.	D2	d2.Retrieve and evaluate information from different sources.
14.	D1	d3.Work in groups and independently

Republic of Yemen  
Ministry of Higher Education  
& Scientific Research  
Yemen University  
College of medical sciences  
Department of pharmacy  
Program of Pharmacy Bachelor



الجمهورية اليمنية  
وزارة التعليم العالي والبحث العلمي  
جامعة اليمن  
كلية العلوم الطبية  
قسم الصيدلة  
برنامج بكالوريوس الصيدلة





## 1. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Distinguish appropriate good manufacturing practice (GMP) and Quality Control (QC) criteria to aseptic and sterile production facilities and other pharmaceutical industry	Lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a2. Identify the principles of quality assurance (QA) in education and of quality assurance of pharmaceutical processes and products.	Lecture	Written exam , Attendance
a3. Recall the principles of various instruments and techniques including manufacturing, packaging, labeling and storing processes in pharmaceutical industry.	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a4. Describe the equipment's of filtration, crystallization, distillation and air purification used in industrial pharmacy with their operation and applications.	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Recommend good manufacturing practice (GMP), good laboratory practice (GLP), good clinical practice (GCP) and good safety practice (GSP) guidelines in pharmaceutical technology, pharmaceutical research and pharmacy practice.	Lecture laboratory practice Feed-back learning	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam) , quizzes
b2. Assess the relationship between equipment design and product characteristics		
b3. Select the best equipment and/or operational line to perform pharmaceutical operation..		
b4. Diagrammatically design the studied equipments for each operation		

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Manage pharmaceutical instruments and equipment safely and efficiently and solve commonly encountered problems in pharmaceutical manufacturing processes	feed-back learning, Group-project	Assignments , Practical assessment (Lab. attendance, reporting, practical exam)
c2. Collect data about different equipment used in pharmaceutical industry and their operation.	feed-back learning, Group-project	Assignments



c3. Conduct research studies and analyze results.	laboratory practice Feed-back learning , Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1. Plan strategies to fulfill workplace pharmaceutical needs	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2. Retrieve and evaluate information from different sources.	Lecture	Written exam , Attendance
d3. Work in groups and independently	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments

<b>III. Course Content:</b>					
<b>1 – Course Topics/Items:</b>					
<b>a – Theoretical Aspect</b>					
Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1	cGMP current good manufacture practice	a1, a2, b1,d1-3	Introduction to current good manufacture practice Starting materials Personnel Building and facilities Complaints and product recalls	1	2
2	cGMP current good manufacture practice	a1, b1, d2,d1-3	Documentations Self-inspection and quality audits Quality assurance and	1	2



			quality control		
3	cGMP current good manufacture practice	b2, d1, d2, ,d1-3	Introduction to validation of manufacturing process Types of process validation Validation of sterile products	1	2
4	Filtration	a4, b3, b4,d1-3	Introduction Mechanism Factors affecting Filter media Filter aids Filtration equipment's Leaf filters Rotator continuous Meta filters Filter press Centrifugal filtration	1	2
5	Air Purification	a4, b3, b4,d1-3	Ways in air purification used in pharmaceutical industry. Effectiveness processes used to purify air. Mechanism of air purification. 1-Filtration. 2-Sedimentation 3-Electricalprecipitation 4- Scrubbing.	1	2
6	Crystallization	a4, b2, b4 ,d1-3	Definition Crystal forms and habit Solubility curves Factors affecting rate of crystal growth Caking of crystals Crystallization equipment	1	2
7	<b>Mid Term Exam.</b>	a1-4,b1-4		1	2
8	Distillation	a4, b2, b4 ,d1-3	Concepts Application Types Equipment's.	1	2
9	Industrial Plants Hazards & Safety	a1-2,b1, ,d1-3	Industrial hazards Types of hazards Noise, equipment noise	1	2



			sources ,level & potential control solutions Industrial effluent testing and treatment Waste Water Treatment		
10	Pharmaceutical packaging	a3,b4,d1-3	Ideal properties, function, , and types of packaging Influence of packaging materials. Glass, metal, plastics, paper & board Films, foils & laminates Rubber Closures Labeling Packaging lines, packaging area, packaging equipment. Package testing & stability.	2	4
11	Standard Operating Procedures (SOPs)	a3,a4,b3, d1, d3	SOP for dissolution apparatus Objective Scope Responsibilities Procedure:	1	2
12	Pharmaceutical Herbal Formulations	a2,a3,b3, d1, d2	Categorization of herbal medicines Quality Safety W.H.O. Guidelines for Quality Standardized Herbal Formulations Advantages of Herbal Medicine Ash values, Extractive values determination Potential Toxic contaminants in herbal formulation Contamination of herbal formulation WHO Guidelines for Potential contaminants in Herbal Formulations Heavy Metal Arsenic Cadmium Lead	2	4



			Microbial Contamination Instrumentation		
13	Role microorganism in Pharmaceutical Industry	a3, b3 ,d1-3	The important products that manufactured by microorganism in pharmaceutical industry Vaccine Antibody Antibiotics Probiotics Source of Probiotics and Effect on Bod Enzyme & Vit. production Bacteriocins Chelation Antimicrobial copper alloy surfaces Phage therapy Antimicrobial activity & disinfection Medical devices Cosmetic microbiology	2	4
14	Final Exam	a1-4,b1-4		1	2
Number of Weeks /and Units Per Semester				16	32

## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



VII. Assignments:				
No.	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Homework Assignments	a1-4, b1-4	Sporadic through the semester	10
2	Reports	c1-3		

VII. Schedule of Assessment Tasks for Students During the Semester					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	b1, b5, c1, c2, d1, d3
2	Assignments (1 + 2)	4, 14	10	10	b1, b5, c1, c2, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b3, b4, b5
4	Mid-semester exam of theoretical part ( written exam	7	20	20	b1, b5, c1, c2, d1, d3
5	Final exam of theoretical part ( written exam)	17	60	60	b1, b5, c1, c2, d1, d3
TOTAL			100	100 %	60

IV. Students' Support:	
Office Hours/week	Other Procedures (if any)
Two contact hours per week	None

V. Learning Resource (MLA style or APA style)S:	
1- Required Textbook(s) ( maximum two )	
	1. , lea & Febiger, (2002),The Theory and Practice of Industrial Pharmacy 2nd Ed, Philadelphia. 2. Sarfaraz K.Niazi ,(2009),Handbooks of Pharmaceutical Manufacturing Formulations 2nd Ed.,
2- Recommended Readings and Reference Materials	
	Rockville, MD,2008,- United States Pharmacopoeia, The United States Pharmacopoeial Convention, Inc., , 31st ed., U.S.A. Reynold, J.E.F., 2000, Martindale, The Extra Pharmacopoeia, The Pharmaceutical Press, 32nd ed.,



	London.
<b>3- Essential References</b>	
	<ul style="list-style-type: none"> <li>- Remington:, 2000, The Science and Practice of Pharmacy, Alfonso, R.G. (Ed.), 20th ed. The University of the Sciences in Philadelphia, U.S.A.,</li> <li>- Allen, L. V., Popovich, N. G., and Ansel, H. C., 2005, Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, 8th Edition ,Lippincott Williams &amp; Wilkins Publishers.</li> </ul>
<b>4- Electronic Materials and Web Sites etc.</b>	
	<a href="http://www.pharmaceutical technology.com">http://www.pharmaceutical technology.com</a> <a href="http://www.sciencedirect.com">http://www.sciencedirect.com</a> <a href="http://www.pubmed.com">http://www.pubmed.com</a> <a href="http://www.google.com">http://www.google.com</a>
<b>5- Other Learning Material:</b>	
	<b>Study tour:</b> A visit to pharmaceutical industries will be an integrated part of the syllabi



## I. Facilities Required:

<b>1 - Accommodation:</b>	<ul style="list-style-type: none"> <li>- Well-equipped lecture halls with data show facilities, whiteboards, net connection, etc.</li> <li>- Well-equipped laboratories with all required equipment and reagents.</li> </ul>
<b>2 - Computing resources:</b>	<ul style="list-style-type: none"> <li>- Computer laboratory with internet facilities.</li> </ul>

## II. Course Improvement Processes:

### 1- Strategies for obtaining student feedback on effectiveness of teaching

- Student-based assessment of the effectiveness of teaching using a questionnaire designed by the Quality Assurance Unit at the end of the semester.
- Meeting with students and faculty (once per semester).

### 2- Other strategies for evaluation of teaching by the instructor or by the department.

- Assessment of the course syllabus and contents by the teachers using a questionnaire designed by the Quality Assurance Unit of the university at the end of the semester.
- Regular meeting and discussion of the course content between the Head of Department and the teaching staff of the course (for theory and practice).

### 3- Processes for improvement of teaching.

- Revision of the course specification and its teaching strategies every three academic years after consideration of all issues raised by the teachers and/or students during regular meetings and discussions.
- Exploring any possible defects in the course that might encountered by the teaching staff and their mitigation in subsequent improved versions of course specification.

### 4- Processes for verifying standards of students' achievement

- Checking of a sample of students' work by an independent faculty member.
- Periodic exchange and check marking of a sample of students' assignments with a faculty member from another institution.
- Adoption of scoring rubrics to assess the students' achievement (both for ongoing or summative assessments).
- Regular follow-up of laboratory logbooks to assess the practical achievement of students.

### 5- Procedures for periodically reviewing of course effectiveness and planning for improvement

- Student rating and feedback





	<ul style="list-style-type: none"> <li>Peer rating and feedback</li> <li>Regular meeting of the Curriculum Committee of the faculty.</li> </ul>
<b>6- Course development plans</b>	
	<ul style="list-style-type: none"> <li>Conducting regular workshops for the staff for improving their course specification skills.</li> <li>Regular revision of course specification and syllabus items.</li> </ul>

### VIII. Course Policies: (including plagiarism, academic honesty, attendance etc)

The University Regulations on academic misconduct will be strictly enforced. Please refer to -----

1	<b>Class Attendance:</b> <ul style="list-style-type: none"> <li>Attendance of all lectures and practical sessions is required. Unexcused absence exceeding 25% of the lectures or practical sessions will disqualify the student from entering the final exam.</li> </ul>
2	<b>Tardy:</b> <p>- Roll will be called in the very beginning of each lecture and practical class. Retardation for more than three weeks without a reasonable excursion, the student involved shall not be allowed to attend the class any longer and consequently shall be considered to be absent.</p>
3	<b>Exam Attendance/Punctuality:</b> <ul style="list-style-type: none"> <li>Exam attendance is obligatory unless being excused by the department and faculty.</li> <li>Absence from assignments or exams will dealt with according to the general policy of the university.</li> </ul>
4	<b>Assignments &amp; Projects:</b> <ul style="list-style-type: none"> <li>Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator.</li> <li>Projects: Not applicable.</li> </ul>
5	<b>Cheating:</b> <ul style="list-style-type: none"> <li>Punishment of cheating will be according to the general policy of the university in this respect.</li> </ul>
6	<b>Plagiarism:</b> <ul style="list-style-type: none"> <li>Plagiarism in written essays, reports, etc. is not accepted, and students who plagiarize the works of others will be punished according to the general policy of the university.</li> </ul>
7	<b>Other policies:</b> <ul style="list-style-type: none"> <li>General policies of the Students' Affairs of the University and the Quality Assurance Unit.</li> </ul>



## Course Specification

### Pharmaceutical MEDICINAL CHEMSITRY III

I. Course Identification and General Information:							
1.	Course Title:	Pharmaceutical MEDICINAL CHEMSITRY III					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 1ST ) semester					
5.	Pre –requisite (if any):	• Medicinal chemistry I, II					
6.	Co –requisite (if any):	• Pharmacology III					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of synthesis, structure activity relationship (SAR), and metabolism of analgesics and drugs used for blood , endocrine glands, central nervous system (CNS) disorders.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explain the correlation between the chemical properties of drugs and their synthesis, identification, biological activity (SAR) and metabolism
2.		a2. Determine physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of analgesics and drugs used for blood, endocrine glands, central nervous system (CNS) disorders.
3.	A4	a3. Comprehend his/her role as a pharmacist in synthesis, designing and identification of drugs.
4.	B1	b1. Differentiate between chemically related drugs.
5.		b2. Interpret the chemical modification applied on parent drugs to produce newer drugs.
6.		b3. Solve chemical problems related to identification, reactions, metabolism of analgesics and drugs used for blood, endocrine glands, central nervous system (CNS) disorders.
7.	B2	b4. Classify analgesics and drugs used for blood, endocrine glands, central nervous system (CNS) disorders.
8.		b5. Compare between chemically related drugs based on their chemical structure and biological activity.
9.	B3	b6. Relate biological activity of drugs to their chemical structure.
10.		b7. Design newer drugs from patent/parent drugs.
11.		b8. Predict the outcomes of reactions, metabolism of drugs and chemical modification if occur in parent drugs..
12.	B4	b9. Assess the appropriateness of chemical modification present in newer drugs in comparison to parent drugs.
13.	C1	c1. Handle efficiently the tools and chemicals used in medicinal chemistry Lab.
14.		c2. Operate successfully the instruments used in medicinal chemistry Lab.
15.	C2	c3. Perform effectively the experiments, practical tasks and including drug synthesis, identification and purification of drugs using pharmacopeial procedures.
16.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works.



17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1.Work successfully in team-work.
20.	D2	d2. Show respect to life & behave in discipline during practicing practical and professional works and assignments..
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4. Demonstrate the ability of time management and self-learning.

1. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
,	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance
		Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5, b6, b7	Lecture	Written exam , Attendance,



		quizzes
b8	Lecture	Written exam , Attendance
b9	Lecture	Written exam , Attendance
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning , Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
	<b>Drugs for blood disorders</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Haematinics (antianemic drugs)</li> <li>• Antihemorrhagic drugs</li> <li>• Anticoagulants</li> </ul>	3	6
	<b>Drugs for endocrine glands disorders</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of :</b> <ul style="list-style-type: none"> <li>• Anterior and posterior pituitary hormones</li> <li>• Drugs for thyroid gland disorders</li> <li>• Antidiabetic drugs: insulin, oral hypoglycemics</li> <li>• Corticosteroids</li> <li>• Estrogens, progestogens, hormonal contraceptives and antiestrogens</li> <li>• Androgens and antiandrogens</li> </ul>	4	8
	<b>MID-TERM EXAM</b>			1	2
	<b>Analgesics</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Narcotic analgesics</li> <li>• Non-narcotic analgesic antipyretic drugs with weak or no anti-inflammatory effect : paracetamol</li> <li>• Non-narcotic Analgesic and antipyretic with anti-inflammatory effect " Non-steroidal anti-inflammatory drugs (NSAIDs): salicylates, fenamates, propionic acid derivatives, acetic acid derivatives, oxicams, newer NSAIDs (ketoprofen, etc)</li> <li>• AntiCOX II NSAIDs (etodolac, meloxicam, coxibs, etc)</li> </ul>	3	6
1	<b>CNS drugs</b>	a1, a2,a3 , b1, b2,	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b>	4	8



	b3, b4, b5, b8, b9,d2	<ul style="list-style-type: none"> <li>• General anaesthetics</li> <li>• Sedatives, hypnotics and anticonvulsants.</li> <li>• Antiepileptics</li> <li>• Antipsychotics and antidepressants</li> <li>• Others</li> </ul> <p>note : narcotic analgesics was discussed in the previous semester in " Pharmacology II" course</p>		12
<b>Course Review</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	Review of the course topics by discussion session.	1	3
<b>FINAL - EXAM</b>			1	3
<b>TOTAL</b>			16	47
<b>Number of Weeks /and Units Per Semester</b>			16 week s	5 Units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>AlignedCourse Intended Learning Outcomes CILOs</b>
1.	Pharmacopeial physicochemical properties , identification of: antanemic : iron preparations	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2.	Pharmacopeial physicochemical properties , identification of: anticoagulants : warfarin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
3.	Pharmacopeial physicochemical properties , identification of: thyroid hormone : l-thyroxin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
4.	Pharmacopeial physicochemical properties , identification of: oral hypoglycemic : glibenclamide	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
5.	Pharmacopeial physicochemical properties , identification of: corticosteroids : hydrocortisone	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
6.	Pharmacopeial physicochemical properties , identification of: : NSAIDs: diclofenac sodium	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
7.	Pharmacopeial physicochemical properties , identification of: : NSAIDs: ketoprofen	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
8.	Pharmacopeial physicochemical properties , identification of: sedatives : diazepam	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
9.	Pharmacopeial physicochemical properties , identification: antiepileptics : carbamazepine	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
10.	Synthesis of drugs	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
11.	Purification of drugs.	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	





## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to hypothetically design newer drugs form a studied patent drug using SAR principles	b7, c5, c6, d1, d3, d5	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, , , a3,b1, b2, b3, b4, b5, b8, b9, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b3, b7, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b3, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, , , a3, b1, b2, b3,b5, b9
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, , , a3,b1, b2, b3, b4, b5, b8, b9, d2
TOTAL			60	60 %	60

Practicalpart assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d5
6	Practical exam (practical)	14	20	20	a2,b1, b3, c1, c2, c3, c4, c6, d5
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Gareth Thomas, Medicinal chemistry: an introduction to, 2007 John Wiley & Sons Ltd.
2. Siddique. A textbook of medicinal chemistry

### 2- Essential References.

1. AshutochKar. Medicinal chemistry, 2007, New age international publisher
2. Rajie. Pharmaceutical chemistry
3. Wermuth. The practice of medicinal chemistry

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of MEDICIANL CHEMISTRY III

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of synthesis, structure activity relationship (SAR), and metabolism of analgesics and drugs used for blood , endocrine glands, central nervous system (CNS) disorders.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Explain the correlation between the chemical properties of drugs and their synthesis, identification, biological activity (SAR) and metabolism
2.		a2. Determine physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of analgesics and drugs used for blood, endocrine glands, central nervous system (CNS) disorders.
3.	A4	a3. Comprehend his/her role as a pharmacist in synthesis, designing and identification of drugs.
4.	B1	b1. Differentiate between chemically related drugs.
5.		b2. Interpret the chemical modification applied on parent drugs to produce newer drugs.
6.		b3. Solve chemical problems related to identification, reactions, metabolism of analgesics and drugs used for blood, endocrine glands, central nervous system (CNS) disorders.
7.	B2	b4. Classify analgesics and drugs used for blood, endocrine glands, central nervous system (CNS) disorders.
8.		b5. Compare between chemically related drugs based on their chemical structure and biological activity.
9.	B3	b6. Relate biological activity of drugs to their chemical structure.
10.		b7. Design newer drugs from patent/parent drugs.
11.		b8. Predict the outcomes of reactions, metabolism of drugs and chemical modification if occur in parent drugs..
12.	B4	b9. Assess the appropriateness of chemical modification present in newer drugs in comparison to parent drugs.
13.	C1	c1. Handle efficiently the tools and chemicals used in medicinal chemistry Lab.
14.		c2. Operate successfully the instruments used in medicinal chemistry Lab.
15.	C2	c3. Perform effectively the experiments, practical tasks and including drug synthesis, identification and purification of drugs using pharmacopeial procedures.
16.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works.



17.	C4	c5 .Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1.Work successfully in team-work.
20.	D2	d2. Show respect to life & behave in discipline during practicing practical and professional works and assignments..
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4. Demonstrate the ability of time management and self-learning.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
,	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skillsto Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance
		Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5, b6, b7	Lecture	Written exam , Attendance,



		quizzes
b8	Lecture	Written exam , Attendance
b9	Lecture	Written exam , Attendance
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning , Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture	Written exam , Attendance
d5	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
	<b>Drugs for blood disorders</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Haematinics (antianemic drugs)</li> <li>• Antihemorrhagic drugs</li> <li>• Anticoagulants</li> </ul>	3	6
	<b>Drugs for endocrine glands disorders</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of :</b> <ul style="list-style-type: none"> <li>• Anterior and posterior pituitary hormones</li> <li>• Drugs for thyroid gland disorders</li> <li>• Antidiabetic drugs: insulin, oral hypoglycemics</li> <li>• Corticosteroids</li> <li>• Estrogens, progestogens, hormonal contraceptives and antiestrogens</li> <li>• Androgens and antiandrogens</li> </ul>	4	8
	<b>MID-TERM EXAM</b>			1	2
	<b>Analgesics</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>• Narcotic analgesics</li> <li>• Non-narcotic analgesic antipyretic drugs with weak or no anti-inflammatory effect : paracetamol</li> <li>• Non-narcotic Analgesic and antipyretic with anti-inflammatory effect " Non-steroidal anti-inflammatory drugs (NSAIDs): salicylates, fenamates, propionic acid derivatives, acetic acid derivatives, oxicams, newer NSAIDs (ketoprofen, etc)</li> <li>• AntiCOX II NSAIDs (etodolac, meloxicam, coxibs, etc</li> </ul>	3	6
1	<b>CNS drugs</b>	a1, a2,a3 , b1, b2,	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b>	4	8





	b3, b4, b5, b8, b9,d2	<ul style="list-style-type: none"> <li>• General anaesthetics</li> <li>• Sedatives, hypnotics and anticonvulsants.</li> <li>• Antiepileptics</li> <li>• Antipsychotics and antidepressants</li> <li>• Others</li> </ul> <p>note : narcotic analgesics was discussed in the previous semester in " Pharmacology II" course</p>		12
<b>Course Review</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	Review of the course topics by discussion session.	1	3
<b>FINAL - EXAM</b>			1	3
<b>TOTAL</b>			16	47
<b>Number of Weeks /and Units Per Semester</b>			16 week s	5 Units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>AlignedCourse Intended Learning Outcomes CILOs</b>
1.	Pharmacopeial physicochemical properties , identification of: antanemic : iron preparations	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2.	Pharmacopeial physicochemical properties , identification of: anticoagulants : warfarin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
3.	Pharmacopeial physicochemical properties , identification of: thyroid hormone : l-thyroxin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
4.	Pharmacopeial physicochemical properties , identification of: oral hypoglycemic : glibenclamide	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
5.	Pharmacopeial physicochemical properties , identification of: corticosteroids : hydrocortisone	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
6.	Pharmacopeial physicochemical properties , identification of: : NSAIDs: diclofenac sodium	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
7.	Pharmacopeial physicochemical properties , identification of: : NSAIDs: ketoprofen	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
8.	Pharmacopeial physicochemical properties , identification of: sedatives : diazepam	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
9.	Pharmacopeial physicochemical properties , identification: antiepileptics : carbamazepine	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
10.	Synthesis of drugs	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
11.	Purification of drugs.	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
<b>PRACTICAL EXAM</b>		<b>1</b>	<b>2</b>	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, c6, d5	4-13	3
2	<b>Group</b> : each group of students will be assigned to hypothetically design newer drugs form a studied patent drug using SAR principles	b7, c5, c6, d1, d3, d5	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, , , a3, b1, b2, b3, b4, b5, b8, b9, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b3, b7, c5, c6, d1, d3, d5
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b3, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, , , a3, b1, b2, b3, b5, b9
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, , , a3, b1, b2, b3, b4, b5, b8, b9, d2
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4, d5
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b3, c1, c2, c3, c4, c6, d5
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b3, c1, c2, c3, c4, c6, d5
6	Practical exam (practical)	14	20	20	a2, b1, b3, c1, c2, c3, c4, c6, d5
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Gareth Thomas, Medicinal chemistry: an introduction to, 2007 John Wiley & Sons Ltd,
2. Siddique. A textbook of medicinal chemistry

### 2- Essential References.

1. AshutochKar. Medicinal chemistry, 2007, New age international publisher
2. Rajie. Pharmaceutical chemistry
3. Wermuth. The practice of medicinal chemistry

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### Pharmaceutical MEDICINAL CHEMSITRY IV

I. Course Identification and General Information:							
1.	Course Title:	Pharmaceutical MEDICINAL CHEMSITRY IV					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	1		-
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 2ND ) semester					
5.	Pre –requisite (if any):	• Medicinal chemistry III					
6.	Co –requisite (if any):	• Pharmacology IV					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of synthesis, structure activity relationship (SAR), and metabolism of chemotherapeutic drugs for infections and cancer.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	<b>A2</b>	<b>a1.</b> Explain the correlation between the chemical properties of drugs and their synthesis, identification, biological activity (SAR) and metabolism
2.		<b>a2.</b> Determine physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of chemotherapeutic drugs for infections and cancer.
3.	<b>A4</b>	<b>a3.</b> Comprehend his/her role as a pharmacist in synthesis, designing and identification of drugs.
4.	<b>B1</b>	<b>b1.</b> Differentiate between chemically related drugs.
5.		<b>b2.</b> Interpret the chemical modification applied on parent drugs to produce newer drugs.
6.	<b>B2</b>	<b>b3.</b> Solve chemical problems related to identification, reactions, metabolism of chemotherapeutic drugs for infections and cancer..
7.		<b>b4.</b> Classify chemotherapeutic drugs for infections and cancer chemically and therapeutically.
8.		<b>b5.</b> Compare between chemically related drugs based on their chemical structure and biological activity.
9.	<b>B3</b>	<b>b6.</b> Relate biological activity of drugs to their chemical structure.
10.		<b>b7.</b> Design newer drugs from patent/parent drugs.
11.		<b>b8.</b> Predict the outcomes of reactions, metabolism of drugs and chemical modification if occur in parent drugs..
12.	<b>B4</b>	<b>b9.</b> Assess the appropriateness of chemical modification present in newer drugs in comparison to parent drugs.
13.	<b>C1</b>	<b>c1.</b> Handle efficiently the tools and chemicals used in medicinal chemistry Lab.
14.		<b>c2.</b> Operate successfully the instruments used in medicinal chemistry Lab.
15.	<b>C2</b>	<b>c3.</b> Perform effectively the experiments, practical tasks and including drug synthesis, identification and purification of drugs using pharmacopeial procedures.
16.	<b>C3</b>	<b>c4.</b> Take the required safety criteria during performing different types of practical and professional pharmacy works.



17.	C4	c5. Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Work respect to life & Behave in discipline during practicing practical and professional works and assignments
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4. Demonstrate the ability of time management , self-learning and problem solving.

1. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance
		Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5, b6, b7	Lecture	Written exam , Attendance,





		quizzes
b8	Lecture	Written exam , Attendance
b9	Lecture	Written exam , Attendance
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning , Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture , laboratory practice	Written exam , Attendance lab. attitude



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CIOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Chemotherapeutic drugs bacterial infections</b> (Antibacterials)	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of Antibacterials</b> <ul style="list-style-type: none"> <li>antibiotics : (<math>\beta</math>-lactams: penicillins, cephalosporins, penems, others), macrolides, aminoglycosides, tetracyclines, chloramphenicols, lincosamides, others</li> <li>Synthetic Antibacterials : sulphonamides, fluoroquinolones, nitrothiazoles (e.g. metronidazole)</li> <li>Antituberculars and antileprotics</li> <li>Antiseptics and disinfectants</li> </ul>	4	8
2	<b>Chemotherapeutic drugs for fungi and viruses infections</b> (Antifungals & antivirals)	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of Antifungals (antimycotics)</b> <ul style="list-style-type: none"> <li>Polyene antibiotics : nystatin, amphotericin B, griseofulvin</li> <li>antimetabolites : flucytosine</li> </ul> <b>Antivirals</b> <ul style="list-style-type: none"> <li>azoles : clotrimazole, miconazoles, etc</li> <li>anti-herpes simplex</li> <li>anti-influenza</li> <li>anti-AIDS</li> <li>immunomodulators e.g. interferone</li> </ul>	3	6
<b>mid-term exam</b>				1	2
3	<b>Chemotherapeutic drugs for parasitic infections</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of Antiprotozoals</b> <ul style="list-style-type: none"> <li>Antamoebics and anti-giardials</li> <li>Anti-leishmanials and anti-toxoplasmosis</li> <li>Antimalarials</li> </ul> <b>Anthelmintics</b> <ul style="list-style-type: none"> <li>For common worms infection</li> </ul>	2	4



			<ul style="list-style-type: none"> <li>For tape worm : trematodes (taenia, H. nana) infections</li> <li>For schistosoma (Bilharzia)infections</li> <li>For filarisis</li> </ul>		
4	<b>Chemotherapeutic drugs for cancer (Anticancers ; antineoplastic)</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>Antimetabolites : methotrexate, 5-flurouracil. 6-mercaptopurine</li> <li>Alkylating agents: nitrogen mustards, alkyl sulphonates, nitrosurea</li> <li>Natural products: antibiotics, plant alkaloids, enzymes, interferons</li> <li>Hormones and hormones anatgonists</li> <li>Radioactive isotopes</li> <li>Miscellaneous: cisplatin, mitotane , etc</li> </ul>	4	8
	<b>Course Review</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	4 Units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>AlignedCourse Intended Learning Outcomes CILOs</b>
1.	Pharmacopeial physicochemical properties , identification of : antibiotic antibacterial : amoxicillin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
2.	Pharmacopeial physicochemical properties , identification of : antibiotic antibacterial : cefixime	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
3.	Pharmacopeial physicochemical properties , identification of : synthetic antibacterial : ciprofloxacin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
4.	pharmacopeial physicochemical properties , identification of : antiviral : acyclovir	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
5.	pharmacopeial physicochemical properties , identification of : antifungal : miconazole	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
6.	pharmacopeial physicochemical properties , identification of : antiviral : zidovudine	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
7.	pharmacopeial physicochemical properties , identification of : antiprotozoal antameobic: metronidazole	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
8.	pharmacopeial physicochemical properties , identification of : antiprotozoal antimalarial : chloroquine	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
9.	Synthesis of drugs	1	4	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
10.	Purification of drugs.	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
<b>PRACTICAL EXAM</b>		1	2	
<b>Total</b>		12	24 equivalent to 12 credit hours	
<b>Number of Weeks</b>			12	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.</p> <p>The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, c6,	4-13	3
2	<b>Group</b> : each group of students will be assigned to hypothetically design newer drugs form a studied patent drug using SAR principles	b7, c5, c6, d1, d3,	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, , , a3,b1, b2, b3, b4, b5, b8, b9, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b3, b7, c5, c6, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b3, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, , , a3, b1, b2, b3,b5, b9
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, , , a3,b1, b2, b3, b4, b5, b8, b9, d2
TOTAL			60	60 %	60

Practicalpart assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2,b1, b3, c1, c2, c3, c4, c6,
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2,b1, b3, c1, c2, c3, c4, c6,
6	Practical exam (practical)	14	20	20	a2,b1, b3, c1, c2, c3, c4, c6,
Total			40	40 %	



## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Gareth Thomas, Medicinal chemistry: an introduction to, 2007 John Wiley & Sons Ltd 2. Siddique. A textbook of medicinal chemistry
<b>2- Essential References.</b>
1. AshutochKar. Medicinal chemistry, 2007, New age international publisher 2. Rajie. Pharmaceutical chemistry 3. Wermuth. The practice of medicinal chemistry
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of MEDICIANL CHEMISTRY IV

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of synthesis, structure activity relationship (SAR), and metabolism of chemotherapeutic drugs for infections and cancer.





### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	<b>A2</b>	<b>a1.</b> Explain the correlation between the chemical properties of drugs and their synthesis, identification, biological activity (SAR) and metabolism
2.		<b>a2.</b> Determine physicochemical properties, synthesis, purification, structure-activity relationship, metabolism of chemotherapeutic drugs for infections and cancer.
3.	<b>A4</b>	<b>a3.</b> Comprehend his/her role as a pharmacist in synthesis, designing and identification of drugs.
4.	<b>B1</b>	<b>b1.</b> Differentiate between chemically related drugs.
5.		<b>b2.</b> Interpret the chemical modification applied on parent drugs to produce newer drugs.
6.	<b>B2</b>	<b>b3.</b> Solve chemical problems related to identification , reactions, metabolism of chemotherapeutic drugs for infections and cancer..
7.		<b>b4 .</b> Classifychemotherapeutic drugs for infections and cancer chemically and therapeutically.
8.		<b>b5.</b> Compare between chemically related drugs based on their chemical structure and biological activity.
9.	<b>B3</b>	<b>b6.</b> Relate biological activity of drugs to their chemical structure.
10.		<b>b7.</b> Design newer drugs from patent/parent drugs.
11.		<b>b8.</b> Predict the outcomes of reactions , metabolism of drugs and chemical modification if occur in parent drugs..
12.	<b>B4</b>	<b>b9 .</b> Assess the appropriateness of chemical modification present in newer drugs in comparison to parent drugs.
13.	<b>C1</b>	<b>c1.</b> Handleefficiently the tools and chemicals used in medicinal chemistry Lab.
14.		<b>c2.</b> Operate successfully the instruments used in medicinal chemistry Lab.
15.	<b>C2</b>	<b>c3 .</b> Perform effectively the experiments , practical tasks and including drug synthesis , identification and purification of drugs using pharmacopeial procedures.
16.	<b>C3</b>	<b>c4 .</b> Take the required safety criteria during performing different types of practical and professional pharmacy works.



17.	C4	c5. Search efficiently for information using documented and electronic sources of information.
18.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
19.	D1	d1. Share successfully in team-work.
20.	D2	d2. Work respect to life & Behave in discipline during practicing practical and professional works and assignments
21.	D3	d3. Communicate effectively with his/her colleagues.
22.	D4	d4. Demonstrate the ability of time management , self-learning and problem solving.

2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture, lab. practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
,	Lecture	Written exam , Attendance
a3	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture laboratory practice	Written exam , Attendance
		Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture Feed-back learning	Written exam , Attendance Assignments , quizzes
b4, b5, b6, b7	Lecture	Written exam , Attendance, quizzes



b8	Lecture	Written exam , Attendance
b9	Lecture	Written exam , Attendance
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
c1, c2, c3, c4	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
c5	feed-back learning, Group-project	Assignments
c6	laboratory practice Feed-back learning , Group-project	Practical assessment (Lab. attendance, reporting, practical exam) Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
d1, d3, d4	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
d2	Lecture , laboratory practice	Written exam , Attendance , lab attitude

#### IV. Course Content:

##### A – Theoretical Aspect:



Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Chemotherapeutic drugs bacterial infections</b> (Antibacterials)	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of Antibacterials</b> <ul style="list-style-type: none"> <li>antibiotics : (<math>\beta</math>-lactams: penicillins, cephalosporins, penems, others), macrolides, aminoglycosides, tetracyclines, chloramphenicols, lincosamides, others</li> <li>Synthetic Antibacterials : sulphonamides, fluoroquinolones, nitrothiazoles (e.g. metronidazole)</li> <li>Antituberculars and antileprotics</li> <li>Antiseptics and disinfectants</li> </ul>	4	8
2	<b>Chemotherapeutic drugs for fungi and viruses infections</b> (Antifungals& antivirals)	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of Antifungals (antimycotics)</b> <ul style="list-style-type: none"> <li>Polyene antibiotics : nystatin, amphotericin B, griseofulvin</li> <li>antimetabolites : flucytosine</li> </ul> <b>Antivirals</b> <ul style="list-style-type: none"> <li>azoles : clotrimazole, miconazoles, etc</li> <li>anti-herpes simplex</li> <li>anti-influenza</li> <li>anti-AIDS</li> <li>immunomodulators e.g. interferone</li> </ul>	3	6
<b>mid-term exam</b>				1	2
3	<b>Chemotherapeutic drugs for parasitic infections</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of Antiprotozoals</b> <ul style="list-style-type: none"> <li>Antamoebics and anti giardials</li> <li>Anti-leishmanials and anti-toxoplasmosis</li> <li>Antimalarials</li> </ul> <b>Anthelmintics</b> <ul style="list-style-type: none"> <li>For common worms infection</li> <li>For tape worm : trematodes (taenia, H. nana) infections</li> <li>For schistosoma (Bilharzia)infections</li> <li>For filarisis</li> </ul>	2	4



4	<b>Chemotherapeutic drugs for cancer (Anticancers ; antineoplastic)</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	<b>Physicochemical properties, synthesis, chemical &amp; common names, structure-activity relationship, metabolism of</b> <ul style="list-style-type: none"> <li>Antimetabolites : methotrexate, 5-flurouracil. 6-mercaptopurine</li> <li>Alkylating agents: nitrogen mustards, alkyl sulphonates, nitrosurea</li> <li>Natural products: antibiotics, plant alkaloids, enzymes, interferons</li> <li>Hormones and hormones anatgonists</li> <li>Radioactive isotopes</li> <li>Miscellaneous: cisplatin, mitotane , etc</li> </ul>	4	8
	<b>Course Review</b>	a1, a2,a3 , b1, b2, b3, b4, b5, b8, b9,d2	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	4 Units

**B - Practical Aspect:**



Order	Tasks/ Experiments	Number of Weeks	contact hours	AlignedCourse Intended Learning Outcomes CILOs
1.	Pharmacopeial physicochemical properties , identification of : antibiotic antibacterial : amoxicillin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
2.	Pharmacopeial physicochemical properties , identification of : antibiotic antibacterial : cefixime	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
3.	Pharmacopeial physicochemical properties , identification of : synthetic antibacterial : ciprofloxacin	1	2	a2,b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
4.	pharmacopeial physicochemical properties , identification of : antiviral : acyclovir	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
5.	pharmacopeial physicochemical properties , identification of : antifungal : miconazole	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
6.	pharmacopeial physicochemical properties , identification of : antiviral : zidovudine	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
7.	pharmacopeial physicochemical properties , identification of : antiprotozoal antameobic: metronidazole	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
8.	pharmacopeial physicochemical properties , identification of : antiprotozoal antimalarial : chloroquine	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
9.	Synthesis of drugs	1	4	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
10.	Purification of drugs.	1	2	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.</p> <p>The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Laboratory practice</b>: students doing experiments in labs individually or in small groups</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : the teacher provide the students with chemical problems related to the studied topics. Every student is assigned to solve some of those problems individually.	b3, c5, c6,	4-13	3
2	<b>Group</b> : each group of students will be assigned to hypothetically design newer drugs form a studied patent drug using SAR principles	b7, c5, c6, d1, d3,	14	2



VII. Schedule of Assessment Tasks for Students During the Semester					
Theoretical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2.5	2.5	a1, a2, , , a3, b1, b2, b3, b4, b5, b8, b9, d2
2	Assignments (1 + 2)	4-13, 14	5	5	b3, b7, c5, c6, d1, d3,
3	Quiz 1 + Quiz 2	7, 12	2.5	2.5	b3, b7
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, , , a3, b1, b2, b3, b5, b9
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, , , a3, b1, b2, b3, b4, b5, b8, b9, d2
TOTAL			60	60 %	60

Practical part assessment					
No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a2, b1, b3, c1, c2, c3, c4, c6, d1, d3, d4,
2	Lab. Attitude	weekly	2.5	2.5	c4, d1, d3, d4
3	Lab. Accomplishments	weekly	5	5	a2, b1, b3, c1, c2, c3, c4, c6,
4	Lab. Reporting	weekly	2.5	2.5	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	a2, b1, b3, c1, c2, c3, c4, c6,
6	Practical exam (practical)	14	20	20	a2, b1, b3, c1, c2, c3, c4, c6,
Total			40	40 %	





## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
<ol style="list-style-type: none"> <li>1. Gareth Thomas, Medicinal chemistry: an introduction to, 2007 John Wiley &amp; Sons Ltd</li> <li>2. Siddique. A textbook of medicinal chemistry</li> </ol>
<b>2- Essential References.</b>
<ol style="list-style-type: none"> <li>1. AshutochKar. Medicinal chemistry, 2007, New age international publisher</li> <li>2. Rajie. Pharmaceutical chemistry</li> <li>3. Wermuth. The practice of medicinal chemistry</li> </ol>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACEUTICAL QUALITY CONTROL

I. Course Identification and General Information:							
1.	Course Title:	PHARMACEUTICAL QUALITY CONTROL					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 2ND ) semester					
5.	Pre –requisite (if any):	• Pharmaceutics I , II , III					
6.	Co –requisite (if any):						
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course deals with the study of the quality management, requirements, procedures as well as the tests applied to evaluate the quality of raw materials, in-process products and finished pharmaceutical products.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Identify the physicochemical properties of raw materials, in-process products and finished products that are used to evaluate their qualities.
2.	A3	a2. Discuss the references, techniques and procedures applied to evaluate the quality of pharmaceutical raw materials, in-process products and finished products.
3.		a3. Explicit the system of management of quality administration in drug plants and governmental quality control lab.
4.	A4	a4. Comprehend his/her role as a pharmacist in evaluating the quality of pharmaceutical raw materials, in-process products and finished products in drug plants and governmental quality control lab.
5.	B1	b1. Express the quality of raw materials, in-process products and finished products using quantitative or qualitative data.
6.		b2. Interpret the out-coming data obtained after qualitative or quantitative analysis of raw materials, in-process products and finished products
7.	B2	b3. Solve problems related to quality of raw materials, in-process products and finished products.
8.		b4. Classify the units of Quality control department in drug plants and governmental quality control lab.
9.	B4	b5. Assess the quality of raw materials, in-process products and finished products using qualitative and quantitative parameters.
10.		b6. Select the appropriate technique to assess a quality parameter
11.	C1	c1. Handle efficiently the tools and chemicals used in pharmaceutical analysis and quality control lab.
12.		c2. Operate successfully the instruments used in pharmaceutical analysis and quality control lab.
13.	C2	c3. Perform effectively the experiments, practical tasks using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works.
15.	C4	c5. Search efficiently for information using documented and electronic sources of information.



16.		c6. Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	D1	d1. Share successfully in team-work.
18.	D2	d2. Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
19.	D3	d3. Communicate effectively with his/her colleagues.
20.	D4	d4. Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2, a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture	Written exam , Attendance



<b>b3</b>	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), Assignments , quizzes
<b>b4</b>	Lecture	Written exam , Attendance
<b>b5, b6</b>	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1, c2, c3, c4</b>	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
<b>c5 , c6</b>	feed-back learning, Group-project laboratory practice	Assignments , Practical assessment (Lab. attendance, reporting, practical exam)
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skillsto Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d2, d3</b>	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
<b>d4</b>	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to Quality control</b>	a3, a4	<ul style="list-style-type: none"> <li>definition of quality, quality control QC, specifications (qualitative and quantitative) , governmental and drug plant QC lab, Relation and mission of quality management system (QMS), quality assurance (QA), GMP and QC</li> <li>Pharmacopeias : the References of quality control : BP, USP: contents , volumes , understanding monographs</li> </ul>	2	4
2	<b>Units of QC lab</b>	a2, a4	<b>missions of</b> a) Raw materials unit b) In-process unit c) Validation unit d) Microbiology unit e) Finished-product unit	1	2
3	<b>Procedures of QC</b>	a2, a4	<ul style="list-style-type: none"> <li>sampling methods, number of samples based on batch size</li> <li>Checking and calibration of equipments</li> <li>Validation of results: accuracy, precision</li> <li>Documenting and reporting</li> <li>Quarantine, releasing and rejecting</li> </ul>	2	4
4	<b>QC tests of raw materials</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	<b>Tests of pharmacopeial specification of raw materials</b> identification, assay, microbial content, impurities content, other tests with examples from the pharmacopeia	2	4
<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>				1	2



5	<b>QC tests of raw process products</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	Evaluation of specification of products resulting from unit-operations : drying, evaporation, filtration, milling, granulation, mixing	2	4
6	<b>QC tests of raw finished products , package and labels</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	<b>specific Tests (pharmacopeial specification) finished products including :</b> <ul style="list-style-type: none"> <li>• Solutions</li> <li>• Suspensions &amp; emulsions</li> <li>• Semisolid products</li> <li>• Suppositories</li> <li>• Powders</li> <li>• Granules</li> <li>• Tablets</li> <li>• Capsules</li> <li>• Sterile products : parenteral, ophthalmic preparations</li> </ul> <b>Testing of pharmacopeial specifications of :</b> <ul style="list-style-type: none"> <li>• Package Labels : information</li> </ul>	4	8
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Couse Intended Learning Outcomes CILOs</b>
1.	QC sampling , checking of equipments & reporting	1	2	a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2.	QC of raw materials : paracetamol BP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
3.	QC of in-process products after : mixing	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
4.	QC of in-process finished products : solution chlorpheniramine syrup BP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
5.	QC of in-process finished products : suspension metronidazole suspension USP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
6.	QC of in-process finished products : creams miconazole cream BP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
7.	QC of in-process finished products : suppositories paracetamol suppositories		2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
8.	QC of in-process finished products : paracetamol tablet friability hardness	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
9.	QC of in-process finished products : paracetamol tablet ( dissolution, disintegration)	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
10.	QC of in-process finished products : capsules amoxicillin capsules USP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
11.	QC labels of labels & package	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	





## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Laboratory practice**: students doing experiments in labs individually or in small groups

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve the problems provided by the teacher at the end of each unit	b3, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on comparison between BP & USP pharmacopeial specifications of <ul style="list-style-type: none"> <li>Raw materials</li> <li>Tablets</li> <li>Capsules</li> <li>Suspensions</li> <li>Microbial content</li> </ul>	c5, c6, d1, d2, d3, d4	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
2	Assignments (1 + 2)	4, 14	5	5	b3, c5, c6, d1, d2, d3, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b4, b6, b7, b8, b9
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b2, b2, b3, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b2, b3, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Marayya. Quality assurance and quality management in pharmaceutical industry
2. British pharmacopeia, 2013 Manohar. pharmaceutical quality assurance

### 2- Essential References.

1. USP, 2009
2. A. P. Kulkarni. Process instrumentation And control
3. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 3- Electronic Materials and Web Sites etc.

- [www.en.wikipedia.org/](http://www.en.wikipedia.org/)
- [www.pharmacoeia.com](http://www.pharmacoeia.com)
- [www.usp.org](http://www.usp.org)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### PHARMACEUTICAL QUALITY CONTROL

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of the quality management, requirements, procedures as well as the tests applied to evaluate the quality of raw materials, in-process products and finished pharmaceutical products.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Identify the physicochemical properties of raw materials, in-process products and finished products that are used to evaluate their qualities.
2.	A3	a2. Discuss the references, techniques and procedures applied to evaluate the quality of pharmaceutical raw materials, in-process products and finished products.
3.		a3. Explicit the system of management of quality administration in drug plants and governmental quality control lab.
4.	A4	a4. Comprehend his/her role as a pharmacist in evaluating the quality of pharmaceutical raw materials, in-process products and finished products in drug plants and governmental quality control lab.
5.	B1	b1. Express the quality of raw materials, in-process products and finished products using quantitative or qualitative data.
6.		b2. Interpret the out-coming data obtained after qualitative or quantitative analysis of raw materials, in-process products and finished products
7.	B2	b3. Solve problems related to quality of raw materials, in-process products and finished products.
8.		b4. Classify the units of Quality control department in drug plants and governmental quality control lab.
9.	B4	b5. Assess the quality of raw materials, in-process products and finished products using qualitative and quantitative parameters.
10.		b6. Select the appropriate technique to assess a quality parameter
11.	C1	c1. Handle efficiently the tools and chemicals used in pharmaceutical analysis and quality control lab.
12.		c2. Operate successfully the instruments used in pharmaceutical analysis and quality control lab.
13.	C2	c3. Perform effectively the experiments, practical tasks using standard procedures.
14.	C3	c4. Take the required safety criteria during performing different types of practical and professional pharmacy works.
15.	C4	c5. Search efficiently for information using documented and electronic sources of information.



16.		<b>c6.</b> Present and report his/her works correctly using appropriate writing rules and technologies media.
17.	<b>D1</b>	<b>d1.</b> Share successfully in team-work.
18.	<b>D2</b>	<b>d2.</b> Comply to pharmacy laws and ethics and behave in discipline during practicing practical and professional works and assignments.
19.	<b>D3</b>	<b>d3.</b> Communicate effectively with his/her colleagues.
20.	<b>D4</b>	<b>d4.</b> Demonstrate time management and self-learning during performing practical and professional works and assignments.

## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Lecture, laboratory practice	Practical assessment (Lab. attendance, accomplishment, reporting, oral/written exam , practical exam)
a2, a3	Lecture	Written exam , Attendance
a4	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment)

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2	Lecture	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
b3	Lecture	Written exam , Attendance



<b>b3</b>	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam), Assignments , quizzes
<b>b4</b>	Lecture	Written exam , Attendance
<b>b5, b6</b>	Lecture laboratory practice	Written exam , Attendance Practical assessment (Lab. attendance, accomplishment, oral/written exam , practical exam)
<b>(C)Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>c1, c2, c3, c4</b>	laboratory practice	Practical assessment (Lab. attendance, accomplishment, attitude, practical exam)
<b>c5 , c6</b>	feed-back learning, Group-project laboratory practice	Assignments , Practical assessment (Lab. attendance, reporting, practical exam)
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
<b>Course Intended Learning Outcomes</b>	<b>Teaching strategies</b>	<b>Assessment Strategies</b>
<b>d1, d2, d3</b>	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, attitude, practical exam) Assignments
<b>d4</b>	laboratory practice Feed-back learning	Practical assessment (Lab. attendance, accomplishment, practical exam) Assignments



## IV. Course Content:

### A – Theoretical Aspect:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to Quality control</b>	a3, a4	<ul style="list-style-type: none"> <li>definition of quality, quality control QC, specifications (qualitative and quantitative) , governmental and drug plant QC lab, Relation and mission of quality management system (QMS), quality assurance (QA), GMP and QC</li> <li>Pharmacopeias : the References of quality control : BP, USP: contents , volumes , understanding monographs</li> </ul>	2	4
2	<b>Units of QC lab</b>	a2, a4	<b>missions of</b> a) Raw materials unit b) In-process unit c) Validation unit d) Microbiology unit e) Finished-product unit	1	2
3	<b>Procedures of QC</b>	a2, a4	<ul style="list-style-type: none"> <li>sampling methods, number of samples based on batch size</li> <li>Checking and calibration of equipments</li> <li>Validation of results: accuracy, precision</li> <li>Documenting and reporting</li> <li>Quarantine, releasing and rejecting</li> </ul>	2	4
4	<b>QC tests of raw materials</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	<b>Tests of pharmacopeial specification of raw materials</b> identification, assay, microbial content, impurities content, other tests with examples from the pharmacopeia	2	4
<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>				1	2





5	<b>QC tests of raw process products</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	Evaluation of specification of products resulting from unit-operations : drying, evaporation, filtration, milling, granulation, mixing	2	4
6	<b>QC tests of raw finished products , package and labels</b>	a1, a2, a4, b1, b2, b3, b4, b5, b6, d3	<b>specific Tests ( pharmacopeial specification) finished products including :</b> <ul style="list-style-type: none"> <li>• Solutions</li> <li>• Suspensions &amp; emulsions</li> <li>• Semisolid products</li> <li>• Suppositories</li> <li>• Powders</li> <li>• Granules</li> <li>• Tablets</li> <li>• Capsules</li> <li>• Sterile products : parenteral, ophthalmic preparations</li> </ul> <b>Testing of pharmacopeial specifications of :</b> <ul style="list-style-type: none"> <li>• Package Labels : information</li> </ul>	4	8
<b>Course Review</b>		a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3	Review of the course topics by discussion session.	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	6 Units



<b>B - Practical Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	QC sampling , checking of equipments & reporting	1	2	a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2.	QC of raw materials : paracetamol BP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
3.	QC of in-process products after : mixing	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
4.	QC of in-process finished products : solution chlorpheniramine syrup BP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
5.	QC of in-process finished products : suspension metronidazole suspension USP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
6.	QC of in-process finished products : creams miconazole cream BP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
7.	QC of in-process finished products : suppositories paracetamol suppositories		2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
8.	QC of in-process finished products : paracetamol tablet friability hardness	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
9.	QC of in-process finished products : paracetamol tablet ( dissolution, disintegration)	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
10.	QC of in-process finished products : capsules amoxicillin capsules USP	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
11.	QC labels of labels & package	1	2	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
PRACTICAL EXAM		1	2	
Total		12	24 equivalent to 12 credit hours	
Number of Weeks			12	



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Laboratory practice**: students doing experiments in labs individually or in small groups
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to solve the problems provided by the teacher at the end of each unit	b3, c6, d4	4-13	3
2	<b>Group</b> : each group of students will be assigned to provide a search-based report on comparison between BP & USP pharmacopeial specifications of <ul style="list-style-type: none"> <li>Raw materials</li> <li>Tablets</li> <li>Capsules</li> <li>Suspensions</li> <li>Microbial content</li> </ul>	c5, c6, d1, d2, d3, d4	14	2



## VII. Schedule of Assessment Tasks for Students During the Semester

### Theoretical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	2	2	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
2	Assignments (1 + 2)	4, 14	5	5	b3, c5, c6, d1, d2, d3, d4
3	Quiz 1 + Quiz 2	7, 12	3	3	b3, b4, b6, b7, b8, b9
4	Mid-semester exam of theoretical part ( written exam	7	10	10	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
5	Final exam of theoretical part ( written exam)	17	40	40	a1, a2, a3, a4, b1, b2, b3, b4, b5, b6, d3
TOTAL			60	60 %	60

### Practical part assessment

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes(CILOs)
1	Lab. Attendance	Weekly	5	5	a1, a2, a4, b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6, d1, d2, d3, d4
2	Lab. Attitude	weekly	2	2	c4, d1, d2, d3
3	Lab. Accomplishments	weekly	5	5	b1, b2, b3, b4, b5, b6, c1, c2, c3, c4, c6
4	Lab. Reporting	weekly	3	3	c6
5	Exam of practice theory (written exam or oral exam)	14	5	5	b1, b2, b2, b3, b5, b6
6	Practical exam (practical)	14	20	20	a1, a2, , b1, b2, b2, b3, b5, b6, c1, c2, c3, c4, c5, c4, c6, d1, d2, d3, d4
Total			40	40 %	



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Marayya. Quality assurance and quality management in pharmaceutical industry
2. British pharmacopeia, 2013 Manohar. pharmaceutical quality assurance

### 2- Essential References.

1. USP, 2009
2. A. P. Kulkarni. Process instrumentation And control
3. Ansel's Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA

### 3- Electronic Materials and Web Sites etc.

- [www.en.wikipedia.org/](http://www.en.wikipedia.org/)
- [www.pharmacoeia.com](http://www.pharmacoeia.com)
- [www.usp.org](http://www.usp.org)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACOLOGY III

I. Course Identification and General Information:							
1.	Course Title:	PHARMACOLOGY III					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 1ST ) semester					
5.	Pre –requisite (if any):	• Pharmacology II					
6.	Co –requisite (if any):	• Pharmaceutical Medicinal chemistry III					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course also deals with the study of pharmacodynamic and pharmacokinetics of analgesics and drugs used for blood , endocrine glands, central nervous system (CNS) disorders.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug posology of analgesics and drugs used for blood , endocrine glands, central nervous system (CNS) disorders.
2.		a2. Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of analgesics and drugs used for blood , endocrine glands, central nervous system (CNS) disorders.
3.	A4	a3. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
4.	B2	b1. Classify analgesics and drugs used for blood , endocrine glands, central nervous system (CNS) disorders..
5.		b2. Compare between therapeutically related drugs based on drug benefits ( in particular efficacy and potency) and drug limitations.
6.	B3	b3. Relate drug indications to MAO of drugs.
7.		b4. Predict drug limitations on the basis of Drug MOA.
8.	B4	b5. Select an appropriate drug for patients based on drug benefits and limitation.
9.	C1	c1. Provide correct information on drug benefits and limitation.
10.	C2	c2 .Search efficiently for information using documented and electronic sources of information.
11.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
12.	D1	d1. work successfully in team-work.
13.	D2	d2. Show respect to life.
14.	D4	d3. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3	Lecture	Written exam , Attendance, quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture, feed-back learning	written exam, attendance, assignment
c2	feed-back learning, Group-project	Assignments
c3	laboratory practice	Practical assessment (Lab. attendance, reporting, practical exam)
c3	Feed-back learning Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d3	Feed-back learning	Assignments





## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	Drugs for blood disorders	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Haematinics (antianaemic drugs)</li> <li>• Antihemorrhagic drugs</li> <li>• Anticoagulants</li> </ul>	3	6
2	Drugs for endocrine glands disorders	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Anterior and posterior pituitary hormones</li> <li>• Drugs for thyroid gland disorders</li> <li>• Antidiabetic drugs: insulin, oral hypoglycemics</li> <li>• Corticosteroids</li> <li>• Estrogens, progesters, hormonal contraceptives and antiestrogens</li> <li>• Androgens and antiandrogens</li> </ul>	4	8
	<b>MIDTERM EXAM</b>			1	2
3	Analgesics	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Narcotic analgesics</li> <li>• Non-narcotic analgesic antipyretic drugs with weak or no anti-inflammatory effect : paracetamol</li> <li>• Non-narcotic Analgesic and antipyretic with anti-inflammatory effect " Non-steroidal anti-inflammatory drugs (NSAIDs): salicylates,</li> </ul>	3	6



			fenamates, propionic acid derivatives, acetic acid derivatives, oxicams, newer NSAIDs (ketoprofen, etc) • AntiCOX II NSAIDs (etodolac, meloxicam, coxibs, etc)		
4	CNS drugs	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• General anaesthetics</li> <li>• Sedatives, hypnotics and anticonvulsants.</li> <li>• Antiepileptics</li> <li>• Antipsychotics and antidepressants</li> <li>• Others</li> </ul> note : narcotic analgesics was discussed in the previous semester in " Pharmacology II" course	4	8
FINAL - EXAM				1	3
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	4 Units

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>



## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to prepare an index booklet of the drugs studied in the course. The index should contain the basic drug information on drug benefits and limitation.	c2, c3, d3	13	6
2	<b>Group :</b> each group of students will be assigned to provide a comparison chart on drugs of the same pharmacologic category. Comparison focuses on drug benefits and limitations.	b2, c2, c3, d1, d3	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, c2, c3, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	, a3, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Katzung –Basic and Clinical Pharmacology, (2007), McGraw-Hill
2. Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.

### 2- Essential References.

1. Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins.
2. Udaykumar. Text book of medical pharmacology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### PHARMACOLOGY & THERAPEUTICS III

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course also deals with the study of pharmacodynamic and pharmacokinetics of analgesics and drugs used for blood, endocrine glands, central nervous system (CNS) disorders.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug posology of analgesics and drugs used for blood , endocrine glands, central nervous system (CNS) disorders.
2.		a2. Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of analgesics and drugs used for blood , endocrine glands, central nervous system (CNS) disorders.
3.	A4	a3. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
4.	B2	b1. Classify analgesics and drugs used for blood , endocrine glands, central nervous system (CNS) disorders..
5.		b2. Compare between therapeutically related drugs based on drug benefits ( in particular efficacy and potency) and drug limitations.
6.	B3	b3. Relate drug indications to MAO of drugs.
7.		b4. Predict drug limitations on the basis of Drug MOA.
8.	B4	b5. Select an appropriate drug for patients based on drug benefits and limitation.
9.	C1	c1. Provide correct information on drug benefits and limitation.
10.	C2	c2 .Search efficiently for information using documented and electronic sources of information.
11.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
12.	D1	d1. work successfully in team-work.
13.	D2	d2. Show respect to life.
14.	D4	d3. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3	Lecture	Written exam , Attendance, quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture, feed-back learning	written exam, attendance, assignment
c2	feed-back learning, Group-project	Assignments
c3	laboratory practice	Practical assessment (Lab. attendance, reporting, practical exam)
c3	Feed-back learning Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d3	Feed-back learning	Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
	<b>Drugs for blood disorders</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Haematinics (antianaemic drugs)</li> <li>• Antihemorrhagic drugs</li> <li>• Anticoagulants</li> </ul>	3	6
	<b>Drugs for endocrine glands disorders</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Anterior and posterior pituitary hormones</li> <li>• Drugs for thyroid gland disorders</li> <li>• Antidiabetic drugs: insulin, oral hypoglycemics</li> <li>• Corticosteroids</li> <li>• Estrogens, progesters, hormonal contraceptives and antiestrogens</li> <li>• Androgens and antiandrogens</li> </ul>	4	8
	<b>MIDTERM EXAM</b>			1	2
	<b>Analgesics</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Narcotic analgesics</li> <li>• Non-narcotic analgesic antipyretic drugs with weak or no anti-inflammatory effect : paracetamol</li> <li>• Non-narcotic Analgesic and antipyretic with anti-inflammatory effect " Non-steroidal anti-inflammatory drugs (NSAIDs): salicylates,</li> </ul>	3	6





			fenamates, propionic acid derivatives, acetic acid derivatives, oxicams, newer NSAIDs (ketoprofen, etc) • AntiCOX II NSAIDs (etodolac, meloxicam, coxibs, etc)		
1	CNS drugs	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• General anaesthetics</li> <li>• Sedatives, hypnotics and anticonvulsants.</li> <li>• Antiepileptics</li> <li>• Antipsychotics and antidepressants</li> <li>• Others</li> </ul> note : narcotic analgesics was discussed in the previous semester in " Pharmacology II" course	4	8
FINAL - EXAM				1	3
TOTAL				16	47
Number of Weeks /and Units Per Semester				16 weeks	5 Units

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>



## VII. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to prepare an index booklet of the drugs studied in the course. The index should contain the basic drug information on drug benefits and limitation.	c2, c3, d3	13	6
2	<b>Group :</b> each group of students will be assigned to provide a comparison chart on drugs of the same pharmacologic category. Comparison focuses on drug benefits and limitations.	b2, c2, c3, d1, d3	14	4

## VIII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, c2, c3, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	, a3, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Katzung –Basic and Clinical Pharmacology, (2007), McGraw-Hill
2. Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.

### 2- Essential References.

1. Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins.
2. Udaykumar. Text book of medical pharmacology

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5.	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6.	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### PHARMACOLOGY & THERAPEUTICS IV

I. Course Identification and General Information:					
1.	Course Title:	PHARMACOLOGY IV			
2.	Course Code & Number:				
3.	Credit hours:	C.H			TOTAL
		Theoretical		P.	
		L.	Tut.	S.	
		2	-	-	2
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 2ND ) semester			
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Pharmacology III</li> </ul>			
6.	Co –requisite (if any):	<ul style="list-style-type: none"> <li>Pharmaceutical Medicinal chemistry IV</li> </ul>			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10.	Prepared By:				
11.	Date of Approval	2015			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course also deals with the study of pharmacodynamic and pharmacokinetics of chemotherapeutic drugs used for infections and cancer.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug posology of chemotherapeutic drugs used for infections and cancer.
2.		a2. Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of chemotherapeutic drugs used for infections and cancer.
3.	A4	a3. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
4.	B2	b1. Classify chemotherapeutic drugs used for infections and cancer.
5.		b2. Compare between therapeutically related drugs based on drug benefits (in particular efficacy and potency) and drug limitations.
6.	B3	b3. Relate drug indications to MAO of drugs.
7.		b4. Predict drug limitations on the basis of Drug MOA.
8.	B4	b5. Select an appropriate drug for patients based on drug benefits and limitation.
9.	C1	c1. Provide correct information on drug benefits and limitation.
10.	C2	c2. Search efficiently for information using documented and electronic sources of information.
11.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
12.	D1	d1. Work successfully in team-work.
13.	D2	d2. Show respect to life.
14.	D4	d3. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3	Lecture	Written exam , Attendance, quizzes
b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture, feed-back learning	written exam, attendance, assignment
c2	feed-back learning, Group-project	Assignments
c3	laboratory practice	Practical assessment (Lab. attendance, reporting, practical exam)
c3	Feed-back learning Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d3	Feed-back learning	Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Chemotherapeutic drugs for bacterial infections</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <b>Antibacterials</b> <ul style="list-style-type: none"> <li>antibiotics : (<math>\beta</math>-lactams: penicillins, cephalosporins, penems, others), macrolides, aminoglycosides, tetracyclines, chloramphenicols, lincosamides, others</li> <li>Synthetic Antibacterials : sulphonamides, fluroquinolones, nitrothiazoles (e.g. metronidazole)</li> <li>Antituberculars and antileprotics</li> <li>Antiseptics and disinfectants</li> </ul>	4	8
2	<b>Chemotherapeutic drugs for fungal &amp; viral infections.</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <b>Antifungals (antimycotics)</b> <ul style="list-style-type: none"> <li>Polyene antibiotics : nystatin, amphotericin B, griseofulvin</li> <li>antimetabolites : flucytosine</li> </ul> <b>azoles : clotrimazole, miconazoles, etc</b> <b>Antivirals</b> <ul style="list-style-type: none"> <li>anti-herpes simplex</li> <li>anti-influenza</li> <li>anti-AIDS</li> <li>immunomodulators e.g. interferone</li> </ul>	3	6
	<b>MIDTERM EXAM</b>			1	2
3	<b>Chemotherapeutic drugs for parasitic infections</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b>	2	4



			<b>Antiprotozoals</b> <ul style="list-style-type: none"> <li>• Antamoebics and anti giardials</li> <li>• Anti-leishmanials and anti-toxoplasmosis</li> <li>• Antimalarials</li> </ul> <b>Anthelmintics</b> <ul style="list-style-type: none"> <li>• For common worms infection</li> <li>• For tape worm : trematodes (taenia, H. nana) infections</li> <li>• For schistosoma (Bilharzia)infections</li> <li>• For filarisis</li> </ul>		
4	<b>Chemotherapy of cancer</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Antimetabolites : methotrexate, 5-flurouracil. 6-mercaptopurine</li> <li>• Alkylating agents: nitrogen mustards, alkyl sulphonates, nitrosurea</li> <li>• Natural products: antibiotics, plant alkaloids, enzymes, interferons</li> <li>• Hormones and hormones anatgonists</li> <li>• Radioactive isotopes</li> </ul> Miscellaneous: cisplatin, mitotane , etc	4	8
FINAL - EXAM				1	3
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 week s	4 Units





## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.  
The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to prepare an index booklet of the drugs studied in the course. The index should contain the basic drug information on drug benefits and limitation.	c2, c3, d3	13	6
2	<b>Group</b> : each group of students will be assigned to provide a comparison chart on drugs of the same pharmacologic category. Comparison focuses on drug benefits and limitations.	b2, c2, c3, d1, d3	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, c2, c3, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3
4	Mid-semester exam of theoretical part (written exam)	7	20	20	, a3, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part (written exam)	17	60	60	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Katzung –Basic and Clinical Pharmacology, (2007), McGraw-Hill 2. Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.
<b>2- Essential References.</b>
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<b>3- Electronic Materials and Web Sites etc.</b>
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## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
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5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### PHARMACOLOGY & THERAPEUTICS IV

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course also deals with the study of pharmacodynamic and pharmacokinetics of chemotherapeutic drugs used for infections and cancer.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & drug posology of chemotherapeutic drugs used for infections and cancer.
2.		a2. Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of chemotherapeutic drugs used for infections and cancer.
3.	A4	a3. Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.
4.	B2	b1. Classify chemotherapeutic drugs used for infections and cancer.
5.		b2. Compare between therapeutically related drugs based on drug benefits (in particular efficacy and potency) and drug limitations.
6.	B3	b3. Relate drug indications to MAO of drugs.
7.		b4. Predict drug limitations on the basis of Drug MOA.
8.	B4	b5. Select an appropriate drug for patients based on drug benefits and limitation.
9.	C1	c1. Provide correct information on drug benefits and limitation.
10.	C2	c2. Search efficiently for information using documented and electronic sources of information.
11.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
12.	D1	d1. Work successfully in team-work.
13.	D2	d2. Show respect to life.
14.	D4	d3. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2	Lecture	Written exam , Attendance
a3	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
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b4	Lecture	Written exam , Attendance
b5	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture, feed-back learning	written exam, attendance, assignment
c2	feed-back learning, Group-project	Assignments
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### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
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## IV. Course Content:

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2	<b>Chemotherapeutic drugs for fungal &amp; viral infections.</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <b>Antifungals (antimycotics)</b> <ul style="list-style-type: none"> <li>Polyene antibiotics : nystatin, amphotericin B, griseofulvin</li> <li>antimetabolites : flucytosine</li> </ul> <b>azoles : clotrimazole, miconazoles, etc</b> <b>Antivirals</b> <ul style="list-style-type: none"> <li>anti-herpes simplex</li> <li>anti-influenza</li> <li>anti-AIDS</li> <li>immunomodulators e.g. interferone</li> </ul>	3	6
	<b>MIDTERM EXAM</b>			1	2
3	<b>Chemotherapeutic drugs for parasitic infections</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b>	2	4



			<b>Antiprotozoals</b> <ul style="list-style-type: none"> <li>• Antamoebics and anti giardials</li> <li>• Anti-leishmanials and anti-toxoplasmosis</li> <li>• Antimalarials</li> </ul> <b>Anthelmintics</b> <ul style="list-style-type: none"> <li>• For common worms infection</li> <li>• For tape worm : trematodes (taenia, H. nana) infections</li> <li>• For schistosoma (Bilharzia)infections</li> <li>• For filarisis</li> </ul>		
4	<b>Chemotherapy of cancer</b>	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2	<b>Pharmacokinetics, Pharmacodynamics [ drug benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of :</b> <ul style="list-style-type: none"> <li>• Antimetabolites : methotrexate, 5-flurouracil. 6-mercaptopurine</li> <li>• Alkylating agents: nitrogen mustards, alkyl sulphonates, nitrosurea</li> <li>• Natural products: antibiotics, plant alkaloids, enzymes, interferons</li> <li>• Hormones and hormones anatgonists</li> <li>• Radioactive isotopes</li> </ul> Miscellaneous: cisplatin, mitotane , etc	4	8
FINAL - EXAM				1	3
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 week s	4 Units





## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.  
The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to prepare an index booklet of the drugs studied in the course. The index should contain the basic drug information on drug benefits and limitation.	c2, c3, d3	13	6
2	<b>Group</b> : each group of students will be assigned to provide a comparison chart on drugs of the same pharmacologic category. Comparison focuses on drug benefits and limitations.	b2, c2, c3, d1, d3	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	b2, c2, c3, d1, d3
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3
4	Mid-semester exam of theoretical part (written exam)	7	20	20	, a3, b2, b3, b4, b5, c1, d2
5	Final exam of theoretical part (written exam)	17	60	60	a1, a2, a3, b1, b2, b3, b4, b5, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
1. Katzung –Basic and Clinical Pharmacology, (2007), McGraw-Hill 2. Rang, Dale and Ritter. Pharmacology, (2007), Churchill Livingstone.
<b>2- Essential References.</b>
1. Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins. 2. Udaykumar. Text book of medical pharmacology
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### DRUG MARKETING & ADVERTISMENT

I. Course Identification and General Information:							
1.	Course Title:	DRUG MARKETING & ADVERTISEMENT					
2.	Course Code &Number:						
3.	Credit hours:	C.H				TOTAL	
		Theoretical			P.		Tr.
		L.	Tut.	S.			
		2	-	-	-		-
4.	Study level/ semester at which this course is offered:	( FIFTH ) Year – ( 2ND ) semester					
5.	Pre –requisite (if any):	• Pharmacoeconomics					
6.	Co –requisite (if any):	• NIL					
7.	Program (s) in which the course is offered:	All BC programs offered by the university					
8.	Language of teaching the course:	ENGLISH					
9.	Location of teaching the course:	IN THE UNIVERSITY					
10	Prepared By:						
11	Date of Approval	2015					

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course is designed to provide the students with knowledge and skills of pharmaceutical marketing necessary to be efficient marketing men/women for drug companies.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Define markets, marketing, promotion, promotional materials, products, competitors, customers, marketing targets, plan and planning.
2.		a2. Discuss the requirement (knowledge and skills) of successful marketing,
3.		a3. Recognize customers need.
4.		a4. Identify the basic characteristics of marketing of pharmaceutical products and its differences from marketing of other products.
5.	A4	a5. Comprehend his/her role as a pharmacist to market pharmaceutical products.
6.	B2	b1. Compare between different types of customers and how to deal with each type.
7.	C3	c1. Demonstrate skills of marketing in role play and in Job applications
8.	C4	c2. Search efficiently for information using documented and electronic sources of information.
9.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. Work successfully in team-activities.
11.	D2	d2. Demonstrate the ability to practice contemporary pharmacy in accordance with professional, legal and ethical standards.
12.	D3	d3. Communicate effectively and cooperate with colleagues.
13.	D4	d4. Demonstrate the ability of time management, self-learning and problem-solving skill



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2 , a3, a4	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture	Written exam , Attendance

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture-discussion	Written exam, assignments
c2, c3	feed-back learning, Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to marketing</b>	a1	<ul style="list-style-type: none"> <li>definitions, (markets, marketing, promotion, promotional materials, products, competitors, customers, marketing targets, plan and planning</li> <li>Significance and objectives of marketing</li> </ul>	2	4
2	<b>Requirements of a successful marketing</b>	a2	<ul style="list-style-type: none"> <li>personnel, mental, skills communication and relationship building</li> <li>Strategy of marketing: planning, execution, evaluation</li> <li>Designing a marketing plan</li> </ul>	3	6
3	<b>Understanding the customers</b>	a3, b1	<ul style="list-style-type: none"> <li>Types of customers</li> <li>Dealing with customers</li> <li>customers need and satisfaction</li> </ul>	2	4
	<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>			1	2
4	<b>Pharmaceutical marketing</b>	a4, a5,	<ul style="list-style-type: none"> <li>significance</li> <li>Who is the med. Rep. ?</li> <li>ethical issues</li> <li>Pharmaceutical products: differences from other products, essential information to be full known on pharmaceutical products (pharmaceutical, pharmacological, commercial )properties</li> <li>Pharmaceutical Promotional materials: brochures, gifts, charts, etc.</li> </ul>	3	6
5	<b>Role play:</b>	c1	<ul style="list-style-type: none"> <li><b>Training on visiting to customers (physicians) :</b> pre-visit preparation ad skills of effective visit (meeting, opening, offering, closing), post-visit evaluation</li> </ul>	2	4



6	<b>Self-marketing { C.V. Job applications and interview }</b>	c1	<ul style="list-style-type: none"> <li>How to prepare C.V.</li> <li>Requirements of successful job application and interview</li> </ul>	1	2
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, c1	Review of course topics	1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	6 Units

## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>





## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to prepare his/her own C.V	c2, c3, d4	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report for comparison of different marketing strategies	b1, c2, c3, d1, d2, d4	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, c1
2	Assignments (1 + 2)	4, 14	10	10	b1, c2, c3, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b1
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, c1
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, c1
TOTAL			100	100 %	100



## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

1. Ross Mulner. Pharmaceutical marketing, Journal of Consumer Marketing, 2005

### 2- Essential References.

1. Handbook of pharmaceutical marketing

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### PHARMACEUTICAL MARKETING

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course is designed to provide the students with knowledge and skills of pharmaceutical marketing necessary to be efficient marketing men/women for drug companies.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A3	a1. Define markets, marketing, promotion, promotional materials, products, competitors, customers, marketing targets, plan and planning.
2.		a2. Discuss the requirement (knowledge and skills) of successful marketing,
3.		a3. Recognize customers need.
4.		a4. Identify the basic characteristics of marketing of pharmaceutical products and its differences from marketing of other products.
5.	A4	a5. Comprehend his/her role as a pharmacist to market pharmaceutical products.
6.	B2	b1. Compare between different types of customers and how to deal with each type.
7.	C3	c1. Demonstrate skills of marketing in role play and in Job applications
8.	C4	c2. Search efficiently for information using documented and electronic sources of information.
9.	C4	c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. Work successfully in team-activities.
11.	D2	d2. Demonstrate the ability to practice contemporary pharmacy in accordance with professional, legal and ethical standards.
12.	D3	d3. Communicate effectively and cooperate with colleagues.
13.	D4	d4. Demonstrate the ability of time management, self-learning and problem-solving skill



2. Alignment CILOs to teaching strategies and assessment strategies		
(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2 , a3, a4	Lecture	Written exam , Attendance
(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Lecture	Written exam , Attendance
(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	lecture-discussion	Written exam, assignments
c2, c3	feed-back learning, Group-project	Assignments
(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d2, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments



## IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to marketing</b>	a1	<ul style="list-style-type: none"> <li>definitions, (markets, marketing, promotion, promotional materials, products, competitors, customers, marketing targets, plan and planning</li> <li>Significance and objectives of marketing</li> </ul>	2	4
2	<b>Requirements of a successful marketing</b>	a2	<ul style="list-style-type: none"> <li>personnel, mental, skills communication and relationship building</li> <li>Strategy of marketing: planning, execution, evaluation</li> <li>Designing a marketing plan</li> </ul>	3	6
3	<b>Understanding the customers</b>	a3, b1	<ul style="list-style-type: none"> <li>Types of customers</li> <li>Dealing with customers</li> <li>customers need and satisfaction</li> </ul>	2	4
	<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>			1	2
4	<b>Pharmaceutical marketing</b>	a4, a5,	<ul style="list-style-type: none"> <li>significance</li> <li>Who is the med. Rep. ?</li> <li>ethical issues</li> <li>Pharmaceutical products: differences from other products, essential information to be full known on pharmaceutical products (pharmaceutical, pharmacological, commercial )properties</li> <li>Pharmaceutical Promotional materials: brochures, gifts, charts, etc.</li> </ul>	3	6
5	<b>Role play:</b>	c1	<ul style="list-style-type: none"> <li><b>Training on visiting to customers (physicians) :</b> pre-visit preparation ad skills of effective visit (meeting, opening, offering, closing), post-visit evaluation</li> </ul>	2	4



6	<b>Self-marketing { C.V. Job applications and interview }</b>	c1	<ul style="list-style-type: none"> <li>How to prepare C.V.</li> <li>Requirements of successful job application and interview</li> </ul>	1	2
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, c1	Review of course topics	1	2
FINAL - EXAM				1	2
TOTAL				16	32
Number of Weeks /and Units Per Semester				16 weeks	6 Units

## V. Teaching strategies of the course:

**Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector

**Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation

**Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills



## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual:</b> every student is assigned to prepare his/her own C.V	c2, c3, d4	4-13	6
2	<b>Group :</b> each group of students will be assigned to provide a search-based report for comparison of different marketing strategies	b1, c2, c3, d1, d2, d4	14	4

## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, c1
2	Assignments (1 + 2)	4, 14	10	10	b1, c2, c3, d1, d2, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b1
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, c1
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, c1
TOTAL			100	100 %	100





## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

2. Ross Mulner. Pharmaceutical marketing, Journal of Consumer Marketing, 2005

### 2- Essential References.

2. Handbook of pharmaceutical marketing

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## IX. Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### BIOSATISTICS & RESEARCH METHODOLOGY

I. Course Identification and General Information:					
1.	Course Title:	BIOSATISTICS & RESEARCH METHODOLOGY			
2.	Course Code & Number:				
3.	Credit hours:	C.H			TOTAL
		Theoretical		P.	
		L.	Tut.	S.	
		2	-	-	2
4.	Study level/ semester at which this course is offered:	( Fifth ) Year – ( 2ND ) semester			
5.	Pre –requisite (if any):	-			
6.	Co –requisite (if any):	-			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10.	Prepared By:				
11.	Date of Approval	2015			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### II. Course Description:

The course is designed to provide the student with knowledge and skills of how to perform researches scientifically and how to write and present their work effectively.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Define research, search, thesis, article, abstract, published paper
2.		a2. Discuss the components of a thesis or a research including introduction, methods, results, discussion, conclusions, recommendations
3.		a3. Identify the procedures and methods of writing a thesis and publishing a research paper.
4.		a4. Determine the types of references and how to write them on a research paper or thesis.
5.	A3	a5. Comprehend his/her role as a pharmacist to implement and obey regulations and acts of medical professions.
6.	B2	b1. Compare between different types of scientific research.
7.	C2	c1. demonstrate skills of presentation of a research.
8.	C3	c2. Search efficiently for information using documented and electronic sources of information.
9.	C4	c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. Work successfully in team-activities.
11.	D2	d2. Demonstrate the ability to practice contemporary pharmacy in accordance with professional, legal and ethical standards.
12.	D3	d3. Communicate effectively and cooperate with colleagues, members of health care team, patients and other people.
13.	D4	d4. Demonstrate the ability of time management, self-learning and problem-solving skills

#### 2. Alignment CILOs to teaching strategies and assessment strategies



**(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2 , a3, a5	Lecture	Written exam , Attendance

**(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1,	Lecture	Written exam , Attendance

**(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	seminar	seminar assessment
c2, c3	feed-back learning, Group-project	Assignments

**(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
	Feed-back learning	Assignments



#### IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to research methodology</b>	a1, a5, d2	<ul style="list-style-type: none"> <li>Definition : research, search, thesis, report, abstracts</li> <li>Types of research and categories of methodologies</li> </ul>	1	3
2	<b>Research Proposal</b>	a3, a5, d2	<ul style="list-style-type: none"> <li>Definition, objectives</li> <li>Components of a proposal</li> <li>Skills of writing a proposal</li> <li>Examples of proposal templates</li> <li>Training on writing a proposal</li> </ul>	2	6
3	<b>Components of a research or a thesis</b>	, a5, , d2	<p>Characteristics, academic requirements and details of a thesis/ research project:</p> <ul style="list-style-type: none"> <li>Titles</li> <li>Dedication</li> <li>Acknowledgment</li> <li>Contents table</li> <li>Table of Lists of Abbreviations and symbols</li> <li>Lists of tables and figures</li> <li>Abstract</li> <li>Scope of the work and Objectives</li> <li>Introduction</li> <li>materials and methods <ul style="list-style-type: none"> <li>Materials</li> <li>Instrumentations</li> <li>Methods</li> <li>Experimental studies</li> <li>Clinical studies (study Population/sample/Sampling technique, Sample size, Variables definition</li> <li>Data analysis</li> </ul> </li> <li>Results : presentation of tables and figures</li> <li>Discussion</li> <li>Conclusions</li> <li>Recommendations</li> <li>References</li> <li>Appendices</li> <li>Arabic abstract</li> </ul>	5	15



			<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>	1	3
4	<b>Thesis/ research paper for publishing</b>	a2, a5, b1, d2	<ul style="list-style-type: none"> <li>How to write a thesis <b>paper</b>, title, abstract, experimental, results &amp; discussion, references,</li> <li>Publishing of articles and preparation of reports</li> </ul>	2	6
5	<b>Preparation and skills of Presentation</b>	a2, a5, , d2	<ul style="list-style-type: none"> <li>Components of a presentation</li> <li>Electronic presentation (power point slides )</li> <li>Characteristics of font, color, background of slides</li> <li>Presentation skills <ul style="list-style-type: none"> <li>Voice intonation</li> <li>Standing /sitting presentation</li> <li>Commenting on slides contents</li> </ul> </li> </ul>	3	9
	<b>Course Review</b>	, a1, a2, a3, a5, b1, , , , d2	Review of the course topics by discussion session.	1	3
			FINAL - EXAM	1	3
	<b>TOTAL</b>			16	48
	<b>Number of Weeks /and Units Per Semester</b>			16 weeks	5 Units



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>
<p><b>Seminars</b>: these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to prepare a scientific article on topics selected by the teachers	c2, c3,	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a scientific presentation on a topic selected by the teacher.	b1, c2, c3, d1, d3,	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	, a1, a2, a3, a5, b1, d2
2	Assignments (1 + 2) including seminar	4, 14	10	10	b1, c2, c3, d1, d4,
3	Quiz 1 + Quiz 2	7, 12	5	5	b1,
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	, a1, a2, a3, a5, b1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	, a1, a2, a3, a5, b1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
C. R. Kothari. Research methodology
<b>2- Essential References.</b>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>





## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of

### RESEARCH METHODOLOGY & PRESENTATION SKILLS

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course is designed to provide the student with knowledge and skills of how to perform researches scientifically and how to write and present their work effectively.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A2	a1. Define research, search, thesis, article, abstract, published paper
2.		a2. Discuss the components of a thesis or a research including introduction, methods, results, discussion, conclusions, recommendations
3.		a3. Identify the procedures and methods of writing a thesis and publishing a research paper.
4.		a4. Determine the types of references and how to write them on a research paper or thesis.
5.	A3	a5. Comprehend his/her role as a pharmacist to implement and obey regulations and acts of medical professions.
6.	B2	b1. Compare between different types of scientific research.
7.	C2	c1. demonstrate skills of presentation of a research.
8.	C3	c2. Search efficiently for information using documented and electronic sources of information.
9.	C4	c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
10.	D1	d1. Work successfully in team-activities.
11.	D2	d2. Demonstrate the ability to practice contemporary pharmacy in accordance with professional, legal and ethical standards.
12.	D3	d3. Communicate effectively and cooperate with colleagues, members of health care team, patients and other people.
13.	D4	d4. Demonstrate the ability of time management, self-learning and problem-solving skills

#### 2. Alignment CILOs to teaching strategies and assessment strategies



<b>(a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge &amp; understanding to Teaching Strategies and Assessment Strategies</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2 , a3, a5	Lecture	Written exam , Attendance
<b>(b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1,	Lecture	Written exam , Attendance
<b>(c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	seminar	seminar assessment
c2, c3	feed-back learning, Group-project	Assignments
<b>(d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3, d4	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
	Feed-back learning	Assignments



#### IV. Course Content:

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>Introduction to research methodology</b>	a1, a5, d2	<ul style="list-style-type: none"> <li>Definition : research, search, thesis, report, abstracts</li> <li>Types of research and categories of methodologies</li> </ul>	1	3
2	<b>Research Proposal</b>	a3, a5, d2	<ul style="list-style-type: none"> <li>Definition, objectives</li> <li>Components of a proposal</li> <li>Skills of writing a proposal</li> <li>Examples of proposal templates</li> <li>Training on writing a proposal</li> </ul>	2	6
3	<b>Components of a research or a thesis</b>	, a5, , d2	<p>Characteristics, academic requirements and details of a thesis/ research project:</p> <ul style="list-style-type: none"> <li>Titles</li> <li>Dedication</li> <li>Acknowledgment</li> <li>Contents table</li> <li>Table of Lists of Abbreviations and symbols</li> <li>Lists of tables and figures</li> <li>Abstract</li> <li>Scope of the work and Objectives</li> <li>Introduction</li> <li>materials and methods <ul style="list-style-type: none"> <li>Materials</li> <li>Instrumentations</li> <li>Methods</li> <li>Experimental studies</li> <li>Clinical studies (study Population/sample/Sampling technique, Sample size, Variables definition</li> <li>Data analysis</li> </ul> </li> <li>Results : presentation of tables and figures</li> <li>Discussion</li> <li>Conclusions</li> <li>Recommendations</li> <li>References</li> <li>Appendices</li> <li>Arabic abstract</li> </ul>	5	15



			<ul style="list-style-type: none"> <li>MID-TERM EXAM</li> <li>Post-exam discussion</li> </ul>	1	3
4	<b>Thesis/ research paper for publishing</b>	a2, a5, b1, d2	<ul style="list-style-type: none"> <li>How to write a thesis <b>paper</b>, title, abstract, experimental, results &amp; discussion, references,</li> <li>Publishing of articles and preparation of reports</li> </ul>	2	6
5	<b>Preparation and skills of Presentation</b>	a2, a5, , d2	<ul style="list-style-type: none"> <li>Components of a presentation</li> <li>Electronic presentation (power point slides )</li> <li>Characteristics of font, color, background of slides</li> <li>Presentation skills <ul style="list-style-type: none"> <li>Voice intonation</li> <li>Standing /sitting presentation</li> <li>Commenting on slides contents</li> </ul> </li> </ul>	3	9
	<b>Course Review</b>	, a1, a2, a3, a5, b1, d2	Review of the course topics by discussion session.	1	3
			FINAL - EXAM	1	3
	<b>TOTAL</b>			16	48
	<b>Number of Weeks /and Units Per Semester</b>			16 weeks	5 Units



## V. Teaching strategies of the course:

<p><b>Lecture</b> It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom. The efficiency of lecturing can be enhanced by using techniques such as <b>Brain-storming</b>: It depends on stimulation of the student's brain through a group of questions &amp;/or <b>Concepts map</b>: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations &amp; by using <b>learning aids</b> such as Data show projector</p>
<p><b>Feed-back learning</b>: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homework, topics summarizing or internet search. The teacher will provide them feed-back correction &amp; evaluation</p>
<p><b>Group projects</b>: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &amp;for promoting team work skills</p>
<p><b>Seminars</b>: these are mainly used with small groups of students (20-30) students in which they find better chances for discussing and participating in the teaching process.</p>

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to prepare a scientific article on topics selected by the teachers	c2, c3,	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a scientific presentation on a topic selected by the teacher.	b1, c2, c3, d1, d3,	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	, a1, a2, a3, a5, b1, d2
2	Assignments (1 + 2) including seminar	4, 14	10	10	b1, c2, c3, d1, d4,
3	Quiz 1 + Quiz 2	7, 12	5	5	b1,
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	, a1, a2, a3, a5, b1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	, a1, a2, a3, a5, b1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

<b>1- Required Textbook(s) ( maximum two ).</b>
C. R. Kothari. Research methodology
<b>2- Essential References.</b>
<b>3- Electronic Materials and Web Sites etc.</b>
<a href="http://www.en.wikipedia.org/">www.en.wikipedia.org/</a>





## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Specification

### **Toxicology & forensic medicine**

<b>I. Course Identification and General Information:</b>					
1.	Course Title:	Toxicology & forensic medicine			
2.	Course Code & Number:				
3.	Credit hours:	C.H			TOTAL
		Theoretical		P.	
		L.	Tut.	S.	
		2	-	-	2
4.	Study level/ semester at which this course is offered:				
5.	Pre –requisite (if any):	<ul style="list-style-type: none"> <li>Pathology</li> <li>Pharmacology I, II</li> </ul>			
6.	Co –requisite (if any):	none			
7.	Program (s) in which the course is offered:	All BC programs offered by the university			
8.	Language of teaching the course:	ENGLISH			
9.	Location of teaching the course:	IN THE UNIVERSITY			
10.	Prepared By:				
11.	Date of Approval	2015			

L: lecturing ; Tut: Tutorial , S: seminar ; P: practical ; Tr.: training

### **II. Course Description:**

The course deals with the study of general principles of toxicity due to chemicals or medicinal agents. The course focuses on sources, mechanism of action , effects on body organs, detection, diagnosis and management of poisoning .



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the toxic pathophysiological effect of poisons on human body organs.
2.	A2	a2. Identify the common chemicals that are poisonous to human.
3.		a3. Determine the mode of action of poisons.
4.		a4. Discuss the approaches of poisons detection, diagnosis and elimination and the procedures of poisoning management.
5.	A4	a5. Comprehend his/her role as a pharmacist in detection, preventing and management of poisoning.
6.	B2	b1. Classify poisons that can harm human, animals and plants.
7.		b2. Compare between different poisons based on their harmful effects sources & management.
8.	B3	b3. Relate the procedure of poisoning management to the type of poisons,
9.		b4. Predict the harmful effects of poisons on body organs.
10.	B4	b5. Assess the degree of poisoning based on diagnostic data.
11.		b6. Select the most appropriate procedure to manage a poisoning.
12.	C2	c1. Manage and limit effectively the harmful effects of poisoning.
13.	C4	c2. Search efficiently for information using documented and electronic sources of information.
14.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
15.	D1	d1. Work successfully in team-work.
16.	D2	d2. Show respect to life and commit to community and patients serving.
17.	D3	d3. Communicate effectively with his/her colleagues.
18.	D4	d4. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4 , a5	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	Lecture, feed-back learning	Written exam , Attendance, assignments
b5, b6	Lecture , feed-back learning	Written exam , Attendance, assignment, quizzes

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Lecture , feed-back learning	Written exam , Attendance, assignment, quizzes
c2, c3	feed-back learning, Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments



## IV. Course Content:

### A.Theoretical part

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>General Toxicology</b>	a1, a2, a3, a4, a5, b1, d2	<ul style="list-style-type: none"> <li>Definitions</li> <li>fundamentals and scope of toxicology.</li> <li>Classification of poisons</li> <li>Causes of toxicity : accidental, commit suicidal, criminal</li> <li>General harmful effects of poisons</li> <li>Approaches to manage poisoning</li> <li>Mode of actions of poisons</li> <li>Diagnosis and detection of poisoning</li> <li>General procedure of management of poisoning</li> </ul>	1	2
sources, mode of action, toxic pathophysiological effects, detection, diagnosis and management of the following types of toxicity					
2	<b>Toxicity caused by acids and alkalis</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>Acids toxicity</li> <li>Alkalis toxicity</li> <li>Salts toxicity</li> </ul>	1	2
3	<b>Toxicity caused by metals and metalloids</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>Toxicity of copper, selenium, Molybdenum, phosphorus</li> <li>Iron toxicity</li> </ul>	2	4
4	<b>Toxicity due to heavy metals</b>	b2, b3, b4, b5, b6, c1, d2	Toxicity of Lead, Mercury and Arsenic	2	4
<b>MID-TERM EXAM</b>				1	2
5	<b>Toxicity due to specific chemicals</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>Toxicity of Cyanide</li> <li>Toxicity of Hydrogen sulfide</li> <li>Carbon monoxide</li> </ul>	2	4
6	<b>Toxicity due to simple organic</b>	b2, b3, b4, b5,	<ul style="list-style-type: none"> <li>Toxicity of Methanol and Isopropyl Alcohols</li> </ul>	2	4



	<b>compounds</b>	b6, c1, d2	<ul style="list-style-type: none"> <li>• Toxicity of hydrocarbons</li> <li>• Toxicity due to fuel materials : petroleum , gasoline, etc</li> </ul>		
7	<b>Toxicity due to poisons killing harmful Living organisms</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>• Toxicity of Rodenticides,</li> <li>• Toxicity of insecticides</li> <li>• Toxicity of Pesticides and Herbicides.</li> <li>• Toxicity of Fungicides</li> </ul>	2	4
8	<b>Narcotic &amp; hypnotictoxicity</b>		<ul style="list-style-type: none"> <li>• Toxicity due to &amp; opiates, benzodiazepines</li> </ul>	1	2
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2	b2	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	8 Units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
physicochemical properties , bioidentification (in human samples: mixed with blood, saliva, urine , skin etc) of one poison belonging to the following categories :				
1.	corrosive acids : $H_2SO_4$	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
2.	corrosive alkalis : NaOH	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
3.	heavy metals : lead	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
4.	Sulfides	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
5.	hydrocarbons : benzene	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
6.	alcohols : ethanol			
7.	Rodenticides	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
8.	insecticides	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
9.	pesticides	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
10.	narcotics	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	



## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.  
The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on toxicity and management of one poison not included in the study topics.	c2, c3, d4	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report supported with illustrating videos on poisonous drugs such as narcotics analgesics , nicotine, khat , overdosing of drugs,	c2, c3, d1, d3, d4	14	4





## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	c2, c3, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

#### REFERENCES

1. kokate, text book of forensic pharmacy
2. Peter Viccellio, Handbook of Medical Toxicology

### 2- Essential References.

1. Casarett&Doull's , Essentials of Toxicology
2. Frank A. Barile, Principles of toxicology Testing R.S. Gaud G.T. Gupta practical physical

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.



## Course Plan (Syllabus) of TOXICOLOGY

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.	Pharmacy department	SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Description:
The course deals with the study of general principles of toxicity due to chemicals or medicinal agents. The course focuses on sources, mechanism of action, effects on body organs, detection, diagnosis and management of poisoning.



### III. Intended learning outcomes of the course (CILOs) and their alignment to Program Intended learning outcomes (PILOs), teaching strategies and assessment strategies

#### 1. Alignment CILOs to PILOs

No.	PILOs	CILOs
1.	A1	a1. Identify the toxic pathophysiological effect of poisons on human body organs.
2.	A2	a2. Identify the common chemicals that are poisonous to human.
3.		a3. Determine the mode of action of poisons.
4.		a4. Discuss the approaches of poisons detection, diagnosis and elimination and the procedures of poisoning management.
5.	A4	a5. Comprehend his/her role as a pharmacist in detection, preventing and management of poisoning.
6.	B2	b1. Classify poisons that can harm human, animals and plants.
7.		b2. Compare between different poisons based on their harmful effects sources & management.
8.	B3	b3. Relate the procedure of poisoning management to the type of poisons,
9.		b4. Predict the harmful effects of poisons on body organs.
10.	B4	b5. Assess the degree of poisoning based on diagnostic data.
11.		b6. Select the most appropriate procedure to manage a poisoning.
12.	C2	c1. Manage and limit effectively the harmful effects of poisoning.
13.	C4	c2. Search efficiently for information using documented and electronic sources of information.
14.		c3. Present and report his/her works correctly using appropriate writing rules and technologies media.
15.	D1	d1. Work successfully in team-work.
16.	D2	d2. Show respect to life and commit to community and patients serving.
17.	D3	d3. Communicate effectively with his/her colleagues.
18.	D4	d4. Demonstrate the ability of time management and self-learning.



## 2. Alignment CILOs to teaching strategies and assessment strategies

### (a) Alignment Course Intended Learning Outcomes (CILOs) of knowledge & understanding to Teaching Strategies and Assessment Strategies

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1, a2, a3, a4 , a5	Lecture	Written exam , Attendance

### (b) Alignment Course Intended Learning Outcomes (CILOs) of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1, b2, b3, b4	Lecture, feed-back learning	Written exam , Attendance, assignments
b5, b6	Lecture , feed-back learning	Written exam , Attendance, assignment, quizzes

### (c) Alignment Course Intended Learning Outcomes (CILOs) of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Lecture , feed-back learning	Written exam , Attendance, assignment, quizzes
c2, c3	feed-back learning, Group-project	Assignments

### (d) Alignment Course Intended Learning Outcomes (CILOs) of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1, d3	Feed-back learning	Assignments
d2	Lecture	Written exam , Attendance
d4	Feed-back learning	Assignments



## IV. Course Content:

### A.Theoretical part

Order	Units/ Topics List	CILOs	Sub Topics List	No. of Weeks	contact hours
1	<b>General Toxicology</b>	a1, a2, a3, a4, a5, b1, d2	<ul style="list-style-type: none"> <li>Definitions</li> <li>fundamentals and scope of toxicology.</li> <li>Classification of poisons</li> <li>Causes of toxicity : accidental, commit suicidal, criminal</li> <li>General harmful effects of poisons</li> <li>Approaches to manage poisoning</li> <li>Mode of actions of poisons</li> <li>Diagnosis and detection of poisoning</li> <li>General procedure of management of poisoning</li> </ul>	1	2
sources, mode of action, toxic pathophysiological effects, detection, diagnosis and management of the following types of toxicity					
2	<b>Toxicity caused by acids and alkalis</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>Acids toxicity</li> <li>Alkalis toxicity</li> <li>Salts toxicity</li> </ul>	1	2
3	<b>Toxicity caused by metals and metalloids</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>Toxicity of copper, selenium, Molybdenum, phosphorus</li> <li>Iron toxicity</li> </ul>	2	4
4	<b>Toxicity due to heavy metals</b>	b2, b3, b4, b5, b6, c1, d2	Toxicity of Lead, Mercury and Arsenic	2	4
<b>MID-TERM EXAM</b>				1	2
5	<b>Toxicity due to specific chemicals</b>	b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>Toxicity of Cyanide</li> <li>Toxicity of Hydrogen sulfide</li> <li>Carbon monoxide</li> </ul>	2	4
6	<b>Toxicity due to simple organic</b>	b2, b3, b4, b5,	<ul style="list-style-type: none"> <li>Toxicity of Methanol and Isopropyl Alcohols</li> </ul>	2	4



	<b>compounds</b>	b6, c1, d2	<ul style="list-style-type: none"> <li>• Toxicity of hydrocarbons</li> <li>• Toxicity due to fuel materials : petroleum , gasoline, etc</li> </ul>		
7	<b>Toxicity due to poisons killing harmful Living organisms</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2	<ul style="list-style-type: none"> <li>• Toxicity of Rodenticides,</li> <li>• Toxicity of insecticides</li> <li>• Toxicity of Pesticides and Herbicides.</li> <li>• Toxicity of Fungicides</li> </ul>	2	4
8	<b>Narcotic &amp; hypnotic toxicity</b>		<ul style="list-style-type: none"> <li>• Toxicity due to &amp; opiates, benzodiazepines</li> </ul>	1	2
	<b>Course Review</b>	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2	b2	1	2
<b>FINAL - EXAM</b>				1	2
<b>TOTAL</b>				16	32
<b>Number of Weeks /and Units Per Semester</b>				16 weeks	8 Units



<b>B - Practical Aspect:</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>contact hours</b>	<b>Aligned Course Intended Learning Outcomes CILOs</b>
physicochemical properties , bioidentification (in human samples: mixed with blood, saliva, urine , skin etc) of one poison belonging to the following categories :				
1.	corrosive acids : $H_2SO_4$	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
2.	corrosive alkalis : NaOH	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
3.	heavy metals : lead	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
4.	Sulfides	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
5.	hydrocarbons : benzene	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
6.	alcohols : ethanol			
7.	Rodenticides	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
8.	insecticides	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
9.	pesticides	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
10.	narcotics	1	2	a2, b1, b2 , b3, c1, c2, c3, c4, c5, d1, d3, d4,
PRACTICAL EXAM		1	2	
<b>Total</b>		<b>12</b>	<b>24 equivalent to 12 credit hours</b>	
<b>Number of Weeks</b>			<b>12</b>	





## V. Teaching strategies of the course:

- Lecture** It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-200) or in sessions, which consist of more than one group gathered in one classroom.  
The efficiency of lecturing can be enhanced by using techniques such as **Brain-storming**: It depends on stimulation of the student's brain through a group of questions &/or **Concepts map**: which depends on sequencing of thoughts in the form of maps with horizontal or vertical relations & by using **learning aids** such as Data show projector
- Feed-back learning**: students are individually asked to do perform quick tests (quiz) or to do certain assignments such lab. experiments, problems solving, homeworks, topics summarizing or internet search. The teacher will provide them feed-back correction & evaluation
- Group projects**: students work on a project in groups of 2 to 3 students. Important for learning by doing ,using the results in practical manner &for promoting team work skills

## VI. Assignments:

No	Assignments	Aligned CILOs	Week Due	Mark
1	<b>Individual</b> : every student is assigned to provide a search-based report on toxicity and management of one poison not included in the study topics.	c2, c3, d4	4-13	6
2	<b>Group</b> : each group of students will be assigned to provide a search-based report supported with illustrating videos on poisonous drugs such as narcotics analgesics , nicotine, khat , overdosing of drugs,	c2, c3, d1, d3, d4	14	4



## VII. Schedule of Assessment Tasks for Students During the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Total course Assessment	Aligned Course Learning Outcomes (CILOs)
1	Attendance	1 - 15	5	5	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2
2	Assignments (1 + 2)	4, 14	10	10	c2, c3, d1, d3, d4
3	Quiz 1 + Quiz 2	7, 12	5	5	b2, b3, b4
4	Mid-semester exam of theoretical part ( written exam)	7	20	20	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2
5	Final exam of theoretical part ( written exam)	17	60	60	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, b6, c1, d2
TOTAL			100	100 %	100

## VIII. Learning Resources:

### 1- Required Textbook(s) ( maximum two ).

#### REFERENCES

1. kokate, text book of forensic pharmacy
2. Peter Viccellio, Handbook of Medical Toxicology

### 2- Essential References.

1. Casarett&Doull's , Essentials of Toxicology
2. Frank A. Barile, Principles of toxicology Testing R.S. Gaud G.T. Gupta practical physical

### 3- Electronic Materials and Web Sites etc.

[www.en.wikipedia.org/](http://www.en.wikipedia.org/)



## IX.Course Policies:

1.	<b>Class Attendance:</b> At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2.	<b>Tardy:</b> any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3.	<b>Exam Attendance/Punctuality:</b> any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4.	<b>Assignments &amp; Projects:</b> Assignments and projects will be assessed individually unless the teacher request for group work
5	<b>Cheating:</b> Cheating by any means will cause the student failure and he/she must re-study the course
6	<b>Plagiarism:</b> Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the college rules.

Republic of Yemen  
Ministry of Higher Education  
& Scientific Research  
Yemen University  
College of medical sciences  
Department of pharmacy  
Program of Pharmacy Bachelor



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جامعة اليمن  
كلية العلوم الطبية  
قسم الصيدلة  
برنامج بكالوريوس الصيدلة