ALYEMENIA University

COLLEGE FOR MEDICAL SCIENCES

BACHELOR OF PHARMACEUTICAL SCIENCES
(B.Pharm. Sciences)

Course Specification

(Total Credit hours: 165 hrs)

B.Sc. in Pharmacy

1. Introduction

The Bachelor of Science in Pharmaceutical Sciences (B.S.P.S.) degree is a five-year baccalaureate program. The Pharmaceutical Sciences represent the collective basic sciences that underlie pharmacy. There are four majors under this degree program. This degree program is designed for students who wish to pursue careers related to the pharmaceutical industry, pharmaceutical science and research, pharmaceutical administration and sales, the biomedical industry, forensic science, as well as health care administration.

The first two years of the B.S.P.S. degree are the pre-professional division; the last two years are the professional division. In the first two years, students in the B.S.P.S program will be broadly trained in the arts, humanities and social sciences, although the natural sciences will receive emphasis. The curriculum of the pre-professional division of the College of Pharmacy is the same for B.S.P.S degree and for the Pharm.D. degree. In the professional division of the B.S.P.S. degree program, advanced courses of study and a practicum in each major lead to a unique concentration in the pharmaceutical fields. A total of 185 semester hours as well as 30 hours training are required for graduation with all the B.S.P.S. --non-Pharm.D. majors.

2. PROGRAM AIMS

The College of Pharmacy offers an undergraduate degree in pharmacy and graduate degrees in pharmaceutical sciences. The College is committed to providing an undergraduate program of quality and excellence that will prepare individuals who will contribute significantly in all settings of pharmacy practice. The experiential learning component of the program ensures students have the opportunity to integrate academic learning with professional practice and to develop the necessary knowledge, skills and attitudes required of practising pharmacists. The College encourages a close working relationship among students, faculty, and staff, and prides itself on its strong association with and support of the pharmacy community at both the provincial and national level.

3. Description of Program

The School of Pharmacy offers an undergraduate program leading to the degree of Bachelor of Science (Pharmacy). This degree is designed to prepare graduates for careers primarily in community and hospital settings but also in the pharmaceutical industry, pharmacy organizations, health sciences research, government, and educational environments.

The program of study leading to the Bachelor of Science (Pharmacy) degree has two phases and requires at least five years to complete. Once in the program students will take courses in the basic health sciences, pharmacy sub-specialties and social/administrative sciences. At the end of each year students will have an opportunity to apply the academic knowledge acquired and to develop and practice patient care skills by participating in experiential learning within community and hospital settings. During the program students will develop an understanding of the professional and societal responsibilities of a pharmacist, and will recognize the need for lifelong learning.

Syllabus for pharmacy (B.Sc. degree)

First Year -
No of weeks: **15**

First semester			Second semester		
Subject	**Theory**	**Pract**	**Subject**	**Theory**	**Pract**
Arabic language101	**2**	**-**	**Arabic language102**	**2**	**-**
English language 1	**2**	**-**	**English language 2**	**2**	**-**
General Biology	**2**	**2**	**Statistics**	**2**	**-**
General chemistry	**2**	**2**	**Introduction to pharmacy History**	**2**	**-**
Islamic culture	**2**	**-**	**Computer skills**	**2**	**-**
Physical pharmacy	**2**	**2**	**Botany**	**2**	**2**
Total hours	**12**	**6**	**Total hours**	**12**	**2**
Credit hours	***15***		***Credit hours***	***13***	

Second Year -
No of weeks: **15**

First semester			Second semester		
Subject	**Theory**	**Pract.**	**Subject**	**Theory**	**Pract**
Physiology 1	**2**	**-**	**Physiology 2**	**2**	**-**
Organic chemistry 1	**2**	**2**	**Histology**	**2**	**2**
Anatomy	**2**	**-**	**Organic chemistry 2**	**2**	**2**
Pharmaceutical calculation	**2**	**-**	**Analytical chemistry 2**	**2**	**2**
Analytical chemistry 1	**2**	**2**	**Pharmaceutics 2**	**2**	**2**
Pharmaceutics 1	**2**	**2**	**Psychology**	**2**	**-**
Immunology &serology	**2**	**-**			
Total hours	**14**	**6**	**Total hours**	**12**	**8**
Credit hours	***17***		***Credit hours***	***16***	

2hrs of actual practical course = 1 credit hour

Third Year -
No of weeks: **15**

First semester			**Second semester**		
Subject	**Theory**	**Pract**	**Subject**	**Theory**	**Pract**
Organic chemistry 3	**2**	**2**	**Organic chemistry 4**	**2**	**2**
Analytical chemistry 3	**2**	**2**	**Pharmacology 1**	**2**	**-**
Pharmacognosy 1	**2**	**2**	**Pharmacognosy 2**	**2**	**2**
Pharmaceutics 3	**2**	**2**	**Pharmaceutics 4**	**2**	**2**
Microbiology 1	**2**	**2**	**Microbiology 2**	**2**	**2**
Biochemistry 1	**2**	**2**	**Biochemistry 2**	**2**	**2**
Total hours	**12**	**12**	**Total hours**	**12**	**10**
Credit hours	**18**		**Credit hours**	**17**	

Summer-training at health facilities (15 Credit hours)

Fourth Year -
No of weeks: **15**

First semester			**Second semester**		
Subject	**Theory**	**Pract .**	**Subject**	**Theory**	**Pract .**
Medicinal chemistry 1	**2**	**2**	**Medicinal chemistry 2**	**2**	**2**
Phytochemistry 1	**2**	**2**	**Phytochemistry 2**	**2**	**2**
Biopharmaceutics & Pharmacokinetics 1	**2**	**2**	**Biopharmaceutics & Pharmacokinetics 2**	**2**	**2**
Pharmacology 2	**2**	**-**	**Pharmacology 3**	**2**	**-**
Pathology	**2**	**-**	**Parasitology**	**2**	**-**
Toxicology	**2**	**2**	**Public Health**	**2**	**-**
First Aid	**2**	**-**			
Total hours	**14**	**8**	**Total hours**	**12**	**6**
Credit hours	***18***		***Credit hours***	***15***	

Summer-training at health facilities (15 Credit hours)

Fifth Year -
No of weeks: **15**

First semester			Second semester		
Subject	**Theory**	**Pract.**	**Subject**	**Theory**	**Pract.**
Medicinal chemistry 3	**2**	**2**	**Medicinal chemistry 4**	**2**	**2**
Applied Pharmacognosy 1	**2**	**2**	**Drug design**	**2**	**-**
Clinical pharmacy 1	**2**	**-**	**Clinical pharmacy 2**	**2**	**-**
Pharmacology 4	**2**	**-**	**Drug marketing**	**2**	**-**
Industrial pharmacy 1	**2**	**2**	**Industrial pharmacy 2**	**2**	**2**
Quality control	**2**	**2**	**Hospital pharmacy1**	**2**	
Community pharmacy	**2**	**-**	**Graduation research project**	**2**	**-**
Total hours	**14**	**8**	**Total hours**	**14**	**4**
Credit hours	**18**		**Credit hours**	**16**	

Graduation research project


First year
First semester

Course specification for General Biology

Course Specification

Programme	Bachelor
Department responsible for the course	Biology
Department teaching the course	Biology
Academic year	First /first semester
Date of specification approval	2015/2016

A-Basic information

Title	**General Biology**			
Credit hours	Lecture	Practical	Total hours	No of weeks per semester
2+1	2	2	3	14

B- PROFESSIONAL INFORMATION

1-AIMS OF THE COURSE

For students undertaking this course, the aims are to:

1. Acquire understanding and knowledge about general characters and economic importance of different microorganisms.
2. Study of the basics on which the different microorganisms are classified into major and minor groups.
3. Study of an idea about plant physiology.

2-Intended Learning Outcomes:

A- Knowledge and Understanding:

A1. Describe the structure of the different organs in each system.
A2. Outline the principles of biological classification and binomial nomenclature؛
A3. Demonstrate an understanding of the evolutionary history of life on earth؛
A4. Examine and describe the structure and function of cells and their organelles؛
A5. Describe the structure of cell membranes and outline the principles governing dialysis, osmosis and membrane transport systems؛
A6. Demonstrate an understanding of cell reproduction, DNA structure and protein synthesis and basic Mendelian genetics؛
A7. Discuss the laws governing energy transformations and the role of enzymes in biological systems؛
A8. Outline the evolution and diversity of animal
A9. Differentiate between the main groups of vertebrates and invertebrates and classify organisms into these groups

B-Intellectual Skills:

B1. Distinguish osmosis and diffusion. B2. Distinguish light and dark reaction in photosynthesis. B1. Distinguish aerobic and anaerobic respiration..

C-Practical Skills:

C1. Isolate, cultivate and purify microorganism C2. Use light microscopic examination in identificatin of microorganisms. C1. Prepare colloidal solution.

D-General Skills and Attitudes:

D1. Work effectively both in a team, and independently on solving problems. D2. Use internet and search for information. D3. Communicate effectively with his teacher and colleagues. D1. Write a scientific assay

3-COURSE CONTENTS:

Topic	No. of hours	No of Lectures
Introduction to biology: • Origin and nature of life, from simplest single-celled forms to complex plants and animals and human beings • Classification and Naming Organisms: principles and problems of classification, taxonomic hierarchy, species concept, binomial nomenclature system of classification.	**4**	**2**
Cell Structure and Function: • An Overview: cell theory, basic cell structure and function, procaryotic and eucaryotic cells, cell organelles • Membrane Structure and Function: basic models of membrane structure, diffusion, osmosis, dialysis, membrane transport: facilitated diffusion, active transport, endocytosis, exocytosis. • Meiosis and mitosis, DNA structure: genes to proteins, simple Mendelian genetics.	**8**	**4**
Energy Transformations: • Metabolism: Ground Rules and Main Principles: laws governing energy transformations, metabolic reactions and pathways, enzymes, coupling and ATP; Energy - Acquiring Metabolism: photosynthesis and chemosynthesis; Energy - Releasing Metabolism: glycolysis, aerobic and anaerobic pathways, and energy yields.	**6**	**3**
Introductory Ecology – • What is ecology? Ecosystem components, flow of energy,	**4**	**2**

biogeochemical cycles, systems ecology, human impact on the environment.		
Genetics : • Basic principles of Mendelism, molecular genetics, structure and function of genes and chromosomes, populations and evolution	**6**	**3**
Total	**28**	**14**

4. Teaching and Learning Methods:

1. Lectures
2. Discussion
3. Lab. Work

5. Student Assessment Methods:

Multiple choice questions, short and long questio	To assess knowledge and theoretical context.
Laboratory work	To assess professional and practical skills
Oral examination	To assess Intellectual skills (understanding and thinking)
Project and exercise	To assess search and information digging (general and transferable skills).

6. Assessment schedule:

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Weighing of Assessments
Assessment 1	Practical examination	Week 13	20%
Assessment 2	Midterm theoretical examination	7	20%
Assessment 3	Final theoretical exam	15-16	60%
Total			100%

7- List of References

7.1- Course Notes
Handout Texts

7.2- Essential Books (Text Books)

8- Facilities Required for Teaching and Learning

1. White board & Markers.
2. Over head projector.
3. Lab

Course specification for General chemistry

Course Specification

Programme	Bachelor
Department responsible for the course	Chemistry
Department teaching the course	Chemistry
Academic year	First /first semester
Date of specification approval	2015/2016

A-Basic information

Title	General chemistry			
Credit hours	Lecture	Practical	Total hours	No of weeks per semester
2+1	2	2	4	14

B- PROFESSIONAL INFORMATION

1-AIMS OF THE COURSE

For students undertaking this course, the aims are to:

1. Know Basic concepts of matter and its classification
2. Understand mass relationships in chemical reactions
3. Acquire properties of gases, liquids, and solids
4. Gain the concepts of thermo chemistry; quantum theory and electronic behavior; periodic relationship of elements in the periodic table; intermolecular forces; and solutions.

2-Intended Learning Outcomes:

A- Knowledge and Understanding:

A1. Apply significant figures and appropriate units in all measurements and calculations;

A2. Classify matter; distinguish between physical and chemical properties/changes;

A3. Define and explain the concepts of atomic mass, average atomic mass, mole, molar mass and perform calculations involving these

A4. Balance and interpret chemical equations and perform stoichiometric calculations

A5. Write, explain and apply the gas laws;

A6. Discuss the kinetic molecular theory (KMT) of gases and use the KMT to qualitatively explain the gas laws; argue the differences between ideal and non-ideal gas behavior;

A7. Define enthalpy; classify common processes as exothermic or endothermic and know the sign conventions;

A8. Trace the various atomic theories; discuss the Bohr model; and explain the line spectra of

A9. hydrogen; Discuss the concept of electron density; contrast the Bohr's orbits with orbital's in the quantum theory;

A10. Write electron configurations and orbital diagrams for multi electron atoms;

A11. Use the periodic table to classify elements and predict trends in properties;

A12. Write Lewis dot symbols and Lewis structure;.

B-Intellectual Skills:

B1. Distinguish different types of matters .
B2. Distinguish different chemical sympols

C-Practical Skills:

C1. Perform chemical experiments
C2. Prepare Chemicals

D-General Skills and Attitudes:

D1. Work effectively both in a team, and independently on solving problems.
D2. Use internet and search for information.
D3. Communicate effectively with his teacher and colleagues.
D2. Write a scientific assay

3-COURSE CONTENTS:

Topic	No. of hours	No of Lectures
1. Introduction to Chemistry 1.1. Matter: Classification, States, Physical, and Chemical Properties	**2**	**1**
2. Atoms, Molecules, and Ions 2.1. The Atomic Theory 2.2. The Structure of the Atom 2.3. Atomic Number, Mass Number, Isotopes 2.4. The Periodic Table 2.5. Molecules and Ions 2.6. Chemical Formulas 2.7. Naming Compounds	**2**	**1**

3. Mass Relationships in Chemical Reaction 3.1. Atomic Mass 3.2. Molar Mass of an Element and Avogadro's Number 3.3. Molecular Mass 3.4. Percent Composition of Compounds 3.5. Chemical Reactions and Chemical Equations 3.6. Amounts of Reactants and Products 3.7. Limiting Reagents 3.8. Reaction Yield **4. Gases**	**4**	**2**
4. **Gases** 4.1. Substances That Exist as Gases 4.2. Pressure of a Gas 4.3. The Gas Laws 4.4. The Ideal Gas Equation 4.5. Gas Stoichiometry 4.6. Dalton's Law of Partial Pressure 4.7. The Kinetic Molecular Theory of Gases 4.8. Deviation from Ideal Behavior	**2**	**1**
5.**Thermochemistry** 5.1. Energy Changes in Chemical Reactions 5.2. Introduction to Thermodynamics 5.3. Enthalpy	**2**	**1**
6. Quantum Theory and the Electronic Structure of Atoms 6.1. From Classical Physics to Quantum Theory 6.2. Bohr's Theory of the Hydrogen Atom 6.3. The Dual Nature of the Electron 6.4. Quantum Mechanics 6.5. Quantum Numbers 6.6. Atomic Orbitals 6.7. Electron Configuration 6.8. The Building-Up Principle	**4**	**2**
7- Periodic Relationships Among the Elements 7.1. Periodic Classification of the Elements 7.2. Periodic Variation in Physical Properties 7.3. Ionization Energy 7.4. Electron Affinity	**2**	**1**
8. Chemical Bonding: Basic Concepts 8.1. Lewis Dot Structure 8.2. The Ionic Bond 8.3. The Covalent Bond 8.4. Electronegativity 8.5. Writing Lewis Structure 8.6. The Concept of Resonance 8.7. Bond Energy	**2**	**1**
9-Chemical Bonding: Molecular Geometry and Hybridization	**4**	**2**

9.1. Molecular Geometry 9.2. Dipole Moments 9.3. The Valence Bond Theory 9.4. Hybridization of Atomic Orbitals 9.5. Hybridization in Molecules Containing Double and Triple Bonds		
10. Intermolecular Forces in Liquids and Solids 10.1. The KMT of Liquids and Solids 10.2. Intermolecular Forces 10.3. Properties of Liquids 10.4. Crystalline vs. Amorphous Solids 10.5. Phase Changes 10.6. Phase Diagrams	**4**	**2**
Total	**28**	**14**

7. Teaching and Learning Methods:

1. Lectures
2. Discussion
3. Lab. Work

8. Student Assessment Methods:

Multiple choice questions, short and long questions	To assess knowledge and theoretical context.
Laboratory work	To assess professional and practical skills
Oral examination	To assess Intellectual skills (understanding and thinking)
Project and exercise	To assess search and information digging (general and transferable skills).

9. Assessment schedule:

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Weighing of Assessments
Assessment 1	Practical examination	Week 13	20%
Assessment 2	Midterm theoretical examination	Week 7	20%
Assessment 3	Final theoretical exam	15-16	60%
Total			100%

7- List of References

7.1- Course Notes
Handout Texts
7.2- Essential Books (Text Books)

8- Facilities Required for Teaching and Learning

1. White board & Markers.
2. Over head projector.
3. Lab

Course specification for Physical Chemistry

Course Specification

Programme	Bachelor
Department responsible for the course	Chemistry
Department teaching the course	Chemistry
Academic year	First /second semester
Date of specification approval	2015/2016

A-Basic information

Title	physical chemistry			
Credit hours	Lecture	Practical	Total hours	No of weeks per semester
2+1	2	2	4	14

B- PROFESSIONAL INFORMATION

1-AIMS OF THE COURSE

For students undertaking this course, the aims are to:

1. Apply the basic principles of thermodynamics, reaction rates and colligative properties;
2. Describe the chemistry of metallo-organic molecules;
3. Apply the basic principles of stereochemistry and chirality in organic chemistry
4. Demonstrate an understanding of the organisation of organic functional groups;
5. Describe simple organic reactions and functional group interconversions;
6. Utilise appropriate laboratory techniques in basic organic, inorganic and physical chemistry..

2-Intended Learning Outcomes:

A- Knowledge and Understanding:

A1 Apply significant figures and appropriate units in all measurements and calculations;
A2 Classify matter; distinguish between physical and chemical properties/changes;
A3 Define and explain the concepts of atomic mass, average atomic mass, mole, molar mass and perform calculations involving these
A4 Balance and interpret chemical equations and perform stoichiometric calculations
A5 Write, explain and apply the gas laws;
A6 Discuss the kinetic molecular theory (KMT) of gases and use the KMT to qualitatively explain the gas laws; argue the differences between ideal and non-ideal gas behavior;
A7 Define enthalpy; classify common processes as exothermic or endothermic and know the sign conventions;
A8 Trace the various atomic theories; discuss the Bohr model; and explain the line spectra of hydrogen; Discuss the concept of electron density; contrast the Bohr's orbits with orbitals in the quantum theory;
A9 Write electron configurations and orbital diagrams for multi electron atoms;
A10 Use the periodic table to classify elements and predict trends in properties;
A11 Write Lewis dot symbols and Lewis structure

B-Intellectual Skills:

B1. Distinguish different types of matters
B2. Distinguish different chemical sympols

C-Practical Skills:

C1. Perform chemical experiments
C3. Prepare Chemicals

D-General Skills and Attitudes:

D1. Work effectively both in a team, and independently on solving problems.
D2. Use internet and search for information.
D3. Communicate effectively with his teacher and colleagues.
D3. Write a scientific assay

3-COURSE CONTENTS:

Topic	No. of hours	No of Lectures
1)Physical chemistry a. Chemical equilibrium b. Principles of Pharmaceutical Analysis c. Gases, liquids and solids – deviations from ideality d. Chemical thermodynamics – principles and applications e. Chemical kinetics - principles and applications f. Electrochemistry - principles and applications g. Intermolecular Forces in Liquids and Solids • The KMT of Liquids and Solids • Intermolecular Forces • Properties of Liquids • Crystalline vs. Amorphous Solids • Phase Changes	**28**	**14**
Total	٢٨	**14**

10. Teaching and Learning Methods:

1. Lectures
2. Discussion
3. Lab. Work

11. Student Assessment Methods:

Multiple choice questions, short and long questio	To assess knowledge and theoretical context.
Laboratory work	To assess professional and practical skills
Oral examination	To assess Intellectual skills (understanding and thinking)
Project and exercise	To assess search and information digging (general and transferable skills).

12. Assessment schedule:

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Weighing of Assessments
Assessment 1	Practical examination	Week 13	20%

Assessment 2	Midterm theoretical examination	Week 7	20%
Assessment 3	Final theoretical exam	15-16	60%
Total			100%

7- List of References

7.1- Course Notes
Handout Texts

7.2- Essential Books (Text Books)

1. *Chemistry 2 Practical Manual*, USQ Publication, Toowoomba.
2. McMurry, J. 1999, *Fundamentals of Organic Chemistry*, 5th edition, Brooks/Cole, California.
3. McMurry, J. 1999, *Study Guide and Solutions Manual for Fundamental of Organic*
4. *Chemistry*, 5th edition, Brooks/Cole, California.
5. McMurry, J. 1999, *Organic Chemistry*, 5th edition, Brooks/Cole, Pacific Grove.
6. McMurry, J. 1999, *Study Guide and Solutions Manual for Organic Chemistry*, 5th edition, Brooks/Cole, California.

8- Facilities Required for Teaching and Learning

1. White board & Markers.
2. Over head projector.
3. Lab

Course specification for English 1

Course Specification

Programme	Bachelor
Department responsible for the course	English
Department teaching the course	English
Academic year	First /first semester
Date of specification approval	2015/2016

A-Basic information

Title	English			
Credit hours	Lecture	Practical	Total hours	No of weeks per semester
2	2	-	-	14

B- PROFESSIONAL INFORMATION

1-AIMS OF THE COURSE

For students undertaking this course, the aims are to:

1. Provide the student with basic principles in English language including reading, writing, listening and grammar with some medical terms.
2. To improve the students for reading, extracting and handling the information from some short passages

2-Intended Learning Outcomes:

A- Knowledge and Understanding:

A1.Correct the mistakes in grammar in some passages.
A2.Extract the information from some short passages.
A3.Define some medical terms

B-Intellectual Skills:

B1. Use correct verbs and grammar in writing

D-General Skills and Attitudes:

D1.Work effectively both in a team, and independently on solving problems.
D2.Use internet and search for information.
D3.Communicate effectively with his teacher and colleagues.
D4.Write a scientific assay

3-COURSE CONTENTS:

Topic	No. of hours	No of Lectures
Reading • Preventive medicine • Infectious diseases • How body fight infection • Nutrition • Malnutrition • Smoking	**4**	**2**

• Tropical diseases		
Grammar • Verb tenses • Simple present • Simple past • Present continuous • Present perfect • Past perfect • Active and passive voice	**6**	**3**
Writing • Report writing • Letter Writing: • Applications / communications such as business correspondences • Official communications and acknowledgements.	**8**	**4**
Listening • Rabies • Heat stroke • Heat exhaustion • Harmful effect of sun on the skin.	**4**	**2**
Some pharmaceutical terms • **Introduction** o Definition o Composition of medical terms o Examples - Pharmaceutical dosage forms. - Drug administration routes - Calculation of drug dosage forms.	**6**	**3**
Total	**28**	**14**

13. Teaching and Learning Methods:

1. Lectures
2. Discussion
3. Lab. Work

14. Student Assessment Methods:

Multiple choice questions, short and long questio	To assess knowledge and theoretical context.
Oral examination	To assess Intellectual skills (understanding and thinking)
Project and exercise	To assess search and information digging (general and transferable skills).

15. Assessment schedule:

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Weighing of Assessments
Assessment 1	Sheet examination	Week 3	10%
Assessment 2	Midterm theoretical examination	Week 7	30%
Assessment 3	Final theoretical exam	15-16	50%
Assessment 4	Oral examination	14-15	10%
Total			**100%**

7- List of References

7.1- Course Notes
Handout Texts

7.2- Essential Books (Text Books)

8- Facilities Required for Teaching and Learning

4. White board & Markers.
5. Over head projector.

Course specification for Arabic language 101

Course Specification

Programme	Bachelor
Department responsible for the course	Language
Department teaching the course	Language
Academic year	First /second semester
Date of specification approval	2015/2016

A-Basic information

Title	Arabic language			
Credit hours	Lecture	Practical	Total hours	No of weeks per semester
2	2	-	-	14

وصف المقرر: صمم هذا المقرر ليزود الطالب بالمعارف والمهارات والاتجاهات السلوكية اللازمة في مجال اللغة العربية والتي تمكنه من تفادي الأخطاء في الكتابة حتى يتسنى له الكتابة الصحيحة عند تعلمه وكتابته للاختبارات والمحاضرات.

الأهداف التعليمية:-

عند نهاية المقرر سيكون الطالب قادراً على أن:-

١. **يعدد أقسام الكلام والأخطاء الإملائية الشائعة**
٢. **يستخرج أسلوب الاستثناء و الحال والتمييز**
٣. **يقوم بالبحث في المعاجم عن أصول الكلمات**
٤. **يستطيع رسم الهمزة وعلامة الترقيم.**
٥. **يفرق بين المبتدأ والخبر**
٦. **يحدد النواحي الأدبية في الجوانب الشعرية**
٧. **يستخرج التوابع اللغوية.**
٨. **يتمكن من كتابه وقرءاه التقارير والرسائل العلمية بصوره بلاغيه ووضوح تام.**

كما أن الطالب سيكون قادراً على أن :-

١. **يميز خصوصيات الابتهالات.**
٢. **يحدد خصوصيات الأدب المعاصر.**
٣. **يشرح معنى الأدب الجاهلي**
٤. **يذكر بعض أمثال العرب**
٥. **يستخرج أوجه البلاغة في خطبه حجه الوداع**
٦. **يذكر خصوصيات الشعر الحديث.**

المفردات :

الوحدة	المحتوي	عدد المحاضرات	عدد الساعات
الأولى	• أقسام الكلام والأخطاء اللغوية الإملائية الشائعة	١	٢
	• من الأدب الجاهلي:	١	٢
	- معلقه طرفه.	١	٢
	- شعر الصعاليك (تأبط شرا)	١	٢
	• من أمثال العرب		
	• خطبه حجه الوداع		
	• علامة الإعراب علامات الترقيم		
الثانية	• المبتدأ والخبر	١	٢
	• الشعر والأدب:	٢	٤
	- المقامة العلمية		
	- سحر الربيع		
	- رثاء الأندلس		
	- قافلة لضياع(بدر شاكر)		
الثالثة	• التوابع	١	٢
	• الأدب المعاصر والابتهالات	١	٢
	• أسلوب الاستثناء	١	٢
	• الحال والتمييز	١	٢
	• البحث في المعاجم	١	٢
	• رسم الهمزة	١	١
	• نماذج من التقارير والرسائل العلمية.		
	الإجمالي	14	٢٨

طرق التدريس :-

- المحاضرات
- المناقشات الجماعية

الوسائل المستخدمة :-

- السبورة
- جهاز العاكس الرأس

طرق التقييم :-

- الاختبارات ٢٠%
- التكاليف ١٠%
- الامتحانات النهائية ٧٠%

الإجمالي ١٠٠%

المراجع :-

١- اللغة العربية (نصوص أدبيه وتطبيقات نحويه-متطلبات الجامعه١٠١-١٠٢)
المؤلفون(د/الحميري،د/الحذيفي،د/الزمر،د/الخربي،د/العبيدي)
٢- قواعد اللغة العربية المؤلف: فواد نعمه

Course Specification of Islamic culture

Course Specification

Programme	Bachelor
Department responsible for the course	Islamic Ethics
Department teaching the course	Islamic Ethics
Academic year	First /second semester
Date of specification approval	2015/2016

A-Basic information

Title	Islamic ethics			
Credit hours	Lecture	Practical	Total hours	No of weeks per seme
2	2	-	-	14

وصف المقرر

صمم هذا المقرر لتزود الطالب بالمعارف والمهارات والاتجاهات السلوكية اللازمة في مجال الأخلاقيات الإسلامية المهنية : والتي تمكنه من التحلي بأخلاقيات الإسلام والصفات التي تميزه عن غيره من الناس في هذا المجال والابتعاد عن المفسدات ومحاوله تعزيز الثوابت وأزاله السلبيات

الأهداف التعليمية:-

1. يكتسب المفاهيم العامة للأخلاقيات الجيدة وأثرها في حياة الفرد.
2. يعدد مبادئ وتعاليم الإسلام ومصادرها وأسسها.
3. يحدد الأخلاقيات التي يدعو الإسلام إليها ويتحلى بها.
4. يشرح رأي الإسلام في القضايا المعاصرة ويقدم الحلول لها .
5. يثقف المجتمع حول العادات الضارة التي ظهرت فيه.
6. يلم بالقوانين الطبية واللوائح المنظمة للمهنة.
7. يدرك أهميه تجنب الأخطاء في المهنة وعقوبتها وفق القانون والشرع.
8. يتحلي بما يدعو إليه الإسلام من أخلاقيات وسلوك.
9. يستشعر عظمه الله وشرعه في تنظيم الحياة للإنسان في هذه المعمورة

Course content

week	Topics	HRS
1	• أسس العقيدة الإسلامية وأثرها التربوي(أركان الإسلام، الإيمان، والإحسان) • مصادر التشريع الإسلامي ومقاصدها • أخلاق يدعو الإسلام إليها : - الصدق - الأمانة - الإخلاص في العمل والعبادة - السرية - الإتقان في العمل - الأخلاق الفاضلة • الإسلام والمرأة الشورى في الإسلام • حقوق الإنسان في الإسلام	٦

	• هدى الإسلام في الصحة والحفاظ عليها اثأر الغزو الفكري	
2	• **مفهوم وأهمية ومصادر علم أخلاقيات المهنة** ○ المفهوم ○ الأهمية المصادر	٤
3	الأبعاد الجديدة لعلم ألأخلاقيات المهنية في نظر الإسلام: - أخلاقيات المهنة- - حكم الإسلام وأخلاقيات في : (الإجهاض،التجميل، نقل الدم والأعضاء ،الاستنساخ، منع الحمل، الأدوية والإدمان،التداوي بالإعشاب والرقي.) تشريح الجثث، الموت الرحيم، الدواء والصوم،	٤
4	• المبادئ الأخلاقية الأساسية في الممارسة المخبريه : - مبدأ الإخلاص والولاء لله لما يخدم المريض. - مبدأ عدم الإضرار بالمريض -مبدأ قول الحقيقة والمحافظة على أسرار المريض - إخلاص النية لله في كل عمل تقوم به للمريض حتى تنال الأجر من الله	٤
5	• ***العوامل المؤثرة على العلاقة بين الطب التشخيصي والمريض :*** - المرض والمعرفة -الخصائص الشخصية لكل من الصيدلي والمريض -الإطار الذي تم فيه هذه العلاقة -لعلاقة الإيجابية/السلبية -العلاقة التوجيهية/المتعاونة المشاركة/ المتبادلة	٤
6	• بعض المشكلات المعاصرة وكيفية حلها في الإسلام : - سوء التغذية - انتشار الأمراض حكم واثر ممارسه العادات الضارة : (المخدرات – المهدئات – اللواط -العادة السرية.....الخ	٤
Total		٢٨

المراجع:

- **الثقافة الإسلامية د/حسن الاهدل، د/ عبد الحكيم**
- **-الجريدة(المجلة) الرسمية المحلية للجمهورية اليمنية**
- **الموسوعة الفقهية الطبية د/ محمد احمد كنعان**


First year
second semester

Course specification to introduction Pharmacy history

Course Specification

Programme	Bachelor
Department responsible for the course	Introduction to Pharmacy profession
Department teaching the course	Pharmaceutics
Academic year	First / second semester
Date of specification approval	2015/2016

A-Basic information

Title	Introduction to Pharmacy profession			
Credit hours	Lecture	Practical	Total hours	No of weeks per semester
2	2	-	2	14

B- PROFESSIONAL INFORMATION

1-AIMS OF THE COURSE

For students undertaking this course, the aims are to:

1. Familiarize students with future of pharmacy profession
2. Develop the students understanding of work areas of pharmacist

2-Intended Learning Outcomes:

A- Knowledge and Understanding:

A1. Give an account of the knowledge and work areas of a pharmacy dispenser,
A2. Give an outline of the organisation of health care and pharmacy,
A3. Give an account of the pharmaceutical process from research and development to consumption,
A4. Give an account of the history of pharmacy,
A5. Use basic pharmaceutical terminology and concepts,
A6. Give an account of the theory of science,
A7. Give an account of the institutions responsible for pharmaceutical products in society,
A8. Give an outline of the quality assurance routines in the area,
A9. Present their own material in pharmacy based on literature studies and study visits.

B-General Skills and Attitudes:

B1. Work effectively both in a team, and independently on solving problems. B2. Use internet and search for information. B3. Communicate effectively with his teacher and colleagues. B4. Write a scientific assay

3-COURSE CONTENTS:

Topic	No. of hours	No of Lectures
• History and scope of pharmacy	**4**	**2**
• Pharmacy careers and ethics	**2**	**1**
• Introduction to pharmacy as a discipline	**4**	**2**
• The function and responsibility of pharmacy dispensing	**4**	**2**
• The organization of health care: laws and regulations	**4**	**2**
• Information retrieval in the pharmacy field	**4**	**2**
• Future of pharmacy practice in different settings ○ Practice of community pharmacy ○ Role of pharmacists in ▪ Industry ▪ Hospital ▪ Government ▪ Military ▪ Research	**4**	**2**
• pharmacy education and international and national organizations	**2**	**1**
Total	**28**	**14**

16. Teaching and Learning Methods:

1. Lectures
2. Discussion

17. Student Assessment Methods:

Multiple choice questions, short and long questio	To assess knowledge and theoretical context.
Oral examination	To assess Intellectual skills (understanding and thinking)
Project and exercise	To assess search and information digging

	(general and transferable skills).

18. Assessment schedule:

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Weighing of Assessments
Assessment 1	Midterm theoretical examination	Week 7	30%
Assessment 2	Final theoretical exam	15-16	60%
Assessment 3	Oral examination	14-15	10%
Total			100%

7- List of References

7.1- Course Notes
Handout Texts

7.2- Essential Books (Text Books)

8- Facilities Required for Teaching and Learning

1. White board & Markers.
2. Over head projector.

Course Specifications Botany

Course Specifications

Programme: Bachelor of Pharmaceutical Sciences

Department responsible for the course: Pharmacognosy

Department teaching the course: Pharmacognosy

Academic year: first /second semester

A- Basic information

Title: Pharmaceutical Botany

Credit hours	Lecture	Practical	Total hours
2+1	2	2	5

B- Professional Information

1- Overall aims of course:

Pharmaceutical Botany is a one semester course aiming

1. To understand the methods of cultivation and processing of Medicinal Plants as drying, packing and preservation.

2. To understand the botanical and biological properties as well as the uses of certain medicinal plants. The students will then be able to understand and make use of our natural plant resources to introduce new herbal drugs.

2- Intended Learning Outcomes Of Course (ILOs)

a- Knowledge and Understanding:

a1- Basic Pharmaceutical Botany that is relevant to botany and medicinal plants.
a2- The different processes for preparing the drug to the market starting from cultivation, collection and drying.
a3- Key constituents and uses of some medicinal plants with advanced biological values.
a4- Recognise and identify some of the common plants they have encountered.
a5- Appropriate practical scientific methods and approaches: observation, experimentation and techniques used in their analysis.

b- Intellectual Skills:

b1- Retrieve, select and collate appropriate traditional botanical and therapeutic information.
b2- Evaluate primary and secondary evidence and arguments.
b3- Integrate and link information across course components, including plant's constituents from different plants families.
b4- Plan and conduct a research task

c- Professional and Practical Skills

c1- Able to do appropriate examinations and sampling programmes in the laboratory, bearing in mind safety and ethical limitations.
c2- Use appropriate basic laboratory equipment safely and efficiently.

c3- Able to explain the principles and limitation of a range of more advanced practical techniques.

d- General and Transferable Skills

d1- Analyse and find effective solutions for problems involving reasonable complex information.

d2- Work effectively as part of a team to produce reports and presentations

d3-Study independently

3- Contents

Topic	**No. of hours**	**Lecture**
Introduction to botany Classification of the Plant Kingdom	4	2
General botany (Brief Description of the Morphology) - Histology - Organography - Reproduction	8	4
Cultivation, propagation, Selection plants of medicinal value	6	3
Collection and Preparation of Medicinal Plants	4	2
The most important plants with pharmaceutical, toxicological, food and cosmetic interest	6	3
Total	**28**	**14**

Teaching and Learning Methods

4.1 Lectures using black board are the principle method of a1 to a4.
Lectures are supplied with notes and research papers.
4.2 Laboratory practicals: using board, microscope and chemical laboratory are the principle method of a3-a5

Student Assessment Methods

5.1 Multiple choice questions, short and long questions to assess knowledge and theoretical context.
5.2 Laboratory work to assess professional and practical skills
5.3 Oral examination to assess Intellectual skills (understanding and thinking)
5.4 Project and exercise to assess search and information digging (general and transferable skills).

Assessment Schedule

Assessment 1 Midterm Practical examination	week 7
Assessment 2 Final theoretical examination	week 14-15
Assessment 3 Final practical examination	week 13

Weighting of Assessments

Midterm exam	20%
Final theoretical examination	60 %
Final practical examination	20 %
Total	100 %

List of references

6.1 Course note
6.1i- Botany and Medicinal Plants
6.1ii- Practical Botany and Medicinal Plants

Course specification of Statistics

Department offering the programme: - pharmacy

Department offering the course: - Pharmacy Practice

Academic year / Level first year/second semester

A- Basic Information

Title: Biostatistics Code:
Credit Hours: 2hr Lecture: 2
Tutorial: Practical: Total:

B- Professional Information

1 – Overall Aims of Course

At the end of this course student should be:

1 Familiar with the various classes (i.e. experimental, observational, overview and health related) of biomedical literature.
2 Aware of the situation when each type of biomedical literature is required
3 Understand the purpose of each type of these literature
4 Familiar with the design of each type and how it differs from the others
5 Familiar with some of the characteristics of each type that is required in the evaluation process.

2 – Intended Learning Outcomes of Course (ILOs)

A-Knowledge and understanding

Students should:

1- Explain the differences between experimental and observational Literature?
2- Justify when meta-analysis studies are usually required and conducted (this question is general for all types).
3- Identify the prevalence of characteristics of diseases in a population.
4- Describe the purpose of the study type
5- Give an example of a study design (Hypothetical) of a clinical trial (this is also a general question).

3-Course content

Topic	Total hours	No. of lectures
• Data description, • Displaying data, • Elementary concepts of the probability, • Theoretical and sample characteristics (mean, dispersion, median, etc).		

• Statistical estimations, confidence intervals. • Testing hypotheses, • one- and two sample t-tests, • Contingency tables and related evaluations. • Regression and correlation analysis, • analysis of variance, • Multiple comparisons. • Non-parametric methods (Mann-Whitney, Wilcoxon, Kruskal-Wallis, Friedman test, rank-correlation).		
Total credit hours		

Books and references

1. Book: Drug Information: Guide for pharmacist 2nd edition (Chapter 7). By Patrick M. Malone & Kristian Wilconson

Evaluation strategies

The students evaluated according to the following scheme:

1. Quiz	5 points
2. Seminar	10 points
3. Midterm theoretical exam	15 points
4. Final theoretical exam	20 points
Total:	**50 points**

Course specification for computer skills

Course Specification

Programme	Bachelor
Department responsible for the course	Computer
Department teaching the course	Computer
Academic year	First / First semester
Date of specification approval	2015/2016

A-Basic information

Title	computer			
Credit hours	Lecture	Practical	Total hours	No of weeks per semester
2	2	-	2	14

B- PROFESSIONAL INFORMATION

1-AIMS OF THE COURSE

For students undertaking this course, the aims are to:

1. To instill an awareness of the various types of information sources available.
2. Provide a technical introduction for computer science and medical information science

2-Intended Learning Outcomes:

A- Knowledge and Understanding:

A1. Define each part of computer hardware and its function.
A2. The basics of how computers operate, with an emphasis on knowledge of practical issues (storage devices, RAM, types of printers etc.)
A3. Define the use of each office program
A4. Have a basic understanding of various computer applications in medicine - for instruction, information managing, computer based medical record, etc.

B-Intellectual Skills:

B1. Tolerate working in MS-WINDOS
B2. Use of WORDPROCESSOR

D-General Skills and Attitudes:

D1. Work effectively both in a team, and independently on solving problems.
D2. Use internet and search for information.
D3. Communicate effectively with his teacher and colleagues.
D5. Write a scientific assay

3-COURSE CONTENTS:

Topic	No. of hours	No of Lectures

Introduction to computers

- Historical background:
- The student will learn briefly the historical development of computers and the evolution of digital world.
- Why should I bother learning?
- What can a computer do?
- In general
  - A computer is a machine, which knows nothing. Yet it is extremely fast in calculations, it has an enormously strong and capacious memory and it doesn't get bored repeating things.
- For me:
- _ Student
    - Textbooks in digital form
    - Demonstrations: digital videos, simulators
    - Internet search
    - _ Physician
    - Keeping records
    - References on CD's
    - Continous medical education
  - _ Researcher
    - Searching the literature
    - Statistical analysis
    - Presentations
  - _ Lecturer
    - Presentations
    - Keeping up to date
  - What are the various computer components and accessories?
    - CPU, BIOS, RAM
    - Input devices: Keyboard, Mouse, Pen, scanner etc…
    - Output devices: Printer, Sound, Monitor, Datashow etc…
    - Storage dedvices: Hard disk, Floppy, CD, Flash etc…
- Role of Software
    - System
- _ Various operating systems
- _ What is the system responsibility
    - Applications
  - _ Word processing
  - _ Database
  - _ Statistics
  - _ Presentations

▪ _ Internet and communication ▪ _ Protecting my computer from virus threats • What is a virus anyway • Why are there viruses • How to defend myself • Keeping updated ▪ **Introduction to Word:** ○ Advantages of using computers instead of typewriter ○ Basic terminology • Document, page, paragraph, line, SPACE • Font ○ Using the keyboard ○ Typing a document ○ Editing and formatting a document • Undo and redo • Font size, type and color • Emphasizing particular words • Alignment • Copy, cut and paste ▪ □□Tables ○ Simple drawings ○ Inserting a picture ○ Saving a document ▪ o Computer Assisted Instruction		
Total	**28**	**14**

19. Teaching and Learning Methods:

1. Lectures
2. Discussion
3. Lab. Work

20. Student Assessment Methods:

Multiple choice questions, short and long questio	To assess knowledge and theoretical context.
Laboratory work	To assess professional and practical skills
Oral examination	To assess Intellectual skills (understanding and thinking)
Project and exercise	To assess search and information digging (general and transferable skills).

21. Assessment schedule:

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Weighing of Assessments
Assessment 1	Sheet examination	Week 7	10%
Assessment 2	Practical examination	Week 13	20%

Assessment 3	Midterm theoretical examination	Week 7	20%
Assessment 4	Final theoretical exam	15-16	50%
Total			100%

7- List of References

7.1- Course Notes
Handout Texts

7.2- Essential Books (Text Books)

8- Facilities Required for Teaching and Learning

1. White board & Markers.
2. Over head projector.
3. Computer
4. Computer software

Course specification for English II

Course Specification

Programme	Bachelor
Department responsible for the course	English
Department teaching the course	English
Academic year	First /second semester
Date of specification approval	2015/2016

A-Basic information

Title	English II			
Credit hours	Lecture	Practical	Total hours	No of weeks per semester
2	2	-	-	14

B- PROFESSIONAL INFORMATION

1-AIMS OF THE COURSE

For students undertaking this course, the aims are to:

1. Provide the student with basic principles in English language including reading, writing, listening and grammar with some medical terms.
2. To improve the students for reading, extracting and handling the information from some short passages

2-Intended Learning Outcomes:

A- Knowledge and Understanding:

A1.Correct the mistakes in grammar in some passages.
A2.Extract the information from some short passages.
A3.Define some medical terms

B-Intellectual Skills:

B1.Use correct verbs and grammar in writing

D-General Skills and Attitudes:

D1.Work effectively both in a team, and independently on solving problems.
D2.Use internet and search for information.
D3.Communicate effectively with his teacher and colleagues.
D4.Write a scientific assay

3-COURSE CONTENTS:

Topic	No. of hours	No of Lectures

Reading • Immunity and immunization • Foods for thought • Malaria • Cholera • Epidemic diseases	**4**	**2**
Grammar ▪ Punctuation ▪ Articles ▪ Phrases ▪ Conditionals ▪ Prepositions	**6**	**3**
Writing • Report writing • Letter Writing: • Applications / communications such as business correspondences • Official communications and acknowledgements.	**8**	**4**
Listening • Anemia • Losing weight • Safe water and foods	**4**	**2**
• **Pharmacological Terminology:** ▪ Classification of drug actions, pharmacokinetics, and systemic classification of drugs. ▪ Autonomic, CNS, cardiovascular, and renal system. ▪ Chemotherapy, locally acting, vitamins and hormones. **Pathology and Diagnosis:** - Infectious diseases. - Rheumatic diseases. - Peptic ulcers. - Surgical operations. - Skin diseases. - Gynecological diseases. - Laboratory investigational terms. Other familiar medical terms and abbreviations	**6**	**3**
Total	**28**	**14**

22. Teaching and Learning Methods:

1. Lectures
2. Discussion
3. Lab. Work

23. Student Assessment Methods:

Multiple choice questions, short and long questio	To assess knowledge and theoretical context.
Oral examination	To assess Intellectual skills (understanding and thinking)
Project and exercise	To assess search and information digging (general and transferable skills).

24. Assessment schedule:

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Weighing of Assessments
Assessment 1	Sheet examination	Week 7	5%
Assessment 2	Midterm theoretical examination	7	15%
Assessment 3	Final theoretical exam	15-16	50%
Assessment 4	Oral examination	14-15	10%
Total			100%

7- List of References

7.1- Course Notes
Handout Texts

7.2- Essential Books (Text Books)

8- Facilities Required for Teaching and Learning

1. White board & Markers.
2. Over head projector.
3. Lab

Course Specification of Arabic Language 102

Course Identification and General Information:							
1	Course Title:	Arabic Language 102					
2	Course Code &Number:	USTY02					
3	Credit hours: 2	C.H				Total	
		Th.	Seminar	Pr	Tr.		
		2	-	-	-	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:	Midwifery					
8	Language of teaching the course:	Arabic					
9	Location of teaching the course:	Faculty of Medical Science					
10	Prepared By:	Dr.					

II. Course Description:

صمم هذا المقرر ليزود الطالب بالمعارف والمهارات والاتجاهات السلوكية اللازمة في مجال اللغة العربية والتي تمكنه من تفادي الأخطاء في الكتابة حتى يتسنى له الكتابة الصحيحة عند تعلمه وكتابته للاختبارات والمحاضرات

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

ILCOs	PILOs
القدرة على كتابة الرسالة الإدارية والتقارير والسيرة الذاتية.	A5
تعريف كل من لأسماء الظاهرة المعربة والمبنية والمبتدأ والخبر.	
توضيح الحكم الإعرابي للفعل والفاعل	
الإلمام بأشهر أبواب النحو التي يستقيم بها اللسان ويعتبر من سلامة القول منطوقاً ومكتوباً.	
الذوق الأدبي من خلال الإطلاع على أشهر النصوص الأدبية.	
تمييز الفروق اللغوية بين التراكيب، والعبارات، والجمل الواردة في كل نص لغوي.	B4
تحليل النصوص الأدبية تحليلا لغويا سليما.	B1
. استخراج المبتدأ والخبر والفعل والفاعل من نص لغوي وإعرابهما.	
إعراب الأسماء والأفعال المبنية والأسماء والأفعال المعربة إعرابًا صحيحًا.	
العمل بفعالية مع زملائه بروح الفريق الواحد أثناء تحليل النص اللغوي داخل القاعة الدراسية.	
تطوير قدراته الذاتية من خلال استخدام مصادر التعلم المختلفة ومنها الانترنت.	

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

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. تعريف كل من لأسماء الظاهرة المعربة والمبنية والمبتدأ والخبر.	المحاضرة المناقشات الحرة والعروض التوضيحية القراءات التحليلية التعلم الذاتي حل المشكلات	الواجبات المنزلية. المشاركة الفاعلة في قاعة الدرس الاختبارات التحريرية والشفهية.
a2. القدرة على كتابة الرسالة الإدارية والتقارير والسيرة الذاتية.	المحاضرة المناقشات الحرة والعروض التوضيحية	الواجبات المنزلية. المشاركة الفاعلة في قاعة الدرس

الاختبارات التحريرية والشفهية.	القراءات التحليلية التعلم الذاتي	
الواجبات المنزلية. المشاركة الفاعلة في قاعة الدرس الاختبارات التحريرية والشفهية.	المحاضرة المناقشات الحرة والعروض التوضيحية القراءات التحليلية التعلم الذاتي	a3.توضيح الحكم الإعرابي للفعل والفاعل
الواجبات المنزلية. المشاركة الفاعلة في قاعة الدرس الاختبارات التحريرية والشفهية.	المحاضرة المناقشات الحرة والعروض التوضيحية القراءات التحليلية التعلم الذاتي حل المشكلات	a4.الإلمام بأشهر أبواب النحو التي يستقيم بها اللسان ويعتبر من سلامة القول منطوقاً ومكتوباً.
(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Assessment Strategies	Teaching strategies	Course Intended Learning Outcomes
الواجبات المنزلية. المشاركة الفاعلة في قاعة الدرس الاختبارات التحريرية والشفهية.	المحاضرة المناقشات الحرة والعروض التوضيحية القراءات التحليلية التعلم الذاتي حل المشكلات	b1. الذوق الأدبي من خلال الإطلاع على أشهر النصوص الأدبية.
الواجبات المنزلية. المشاركة الفاعلة في قاعة الدرس الاختبارات التحريرية والشفهية.	المناقشات الحرة والعروض التوضيحية المحاضرة لقراءات التحليلية	b2. تمييز الفروق اللغوية بين التراكيب، والعبارات، والجمل الواردة في كل نص لغوي.
الواجبات المنزلية. المشاركة الفاعلة في قاعة الدرس الاختبارات التحريرية والشفهية.	المناقشات الحرة والعروض التوضيحية القراءات التحليلية التعلم الذاتي	b3. تحليل النصوص الأدبية تحليلا لغويا سليما.
(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Assessment Strategies	Teaching strategies	Course Intended Learning Outcomes
تكاليف. المشاركة الفاعلة في قاعة الدرس	المحاضرة المناقشات الحرة والعروض التوضيحية القراءات التحليلية	c1. استخراج المبتدأ والخبر والفعل والفاعل من نص لغوي وإعرابهما.
تكاليف. المشاركة الفاعلة في قاعة الدرس	المحاضرة المناقشات الحرة والعروض التوضيحية القراءات التحليلية حل المشكلات	c2.إعراب الأسماء والأفعال المبنية والأسماء والأفعال المعربة إعرابًا صحيحًا.
(D) Alignment Course Intended Learning Outcomes of General and Transferable Skills to Teaching Strategies and Assessment Strategies:		
Assessment Strategies	Teaching strategies	Course Intended Learning Outcomes
الملاحظة تقييم الأقران. الاستبيانات الأسئلة المباشرة	المحاضرة المحاضرة وحل المشكلات. التعلم التعاوني البحث والاستقصاء إدارة حوار بلغة عربية فصيحة.	d1. العمل بفعالية مع زملائه بروح الفريق الواحد أثناء تحليل النص اللغوي داخل القاعة الدراسية.
الملاحظة تقييم الأقران.	المحاضرة وحل المشكلات. التعلم التعاوني	d2.تطوير قدراته الذاتية من خلال استخدام مصادر التعلم المختلفة ومنها الانترنت.

الاستبيانات الأسئلة المباشرة	البحث والاستقصاء إدارة حوار بلغة عربية فصيحة.	

IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	No. of Weeks	Contact hours	Learning Outcomes
1	مهارة القراءة الجهرية	قراءة نصوص نثرية وشعرية تدريبات صفية	2	4	b1,b2
2	مهارة القراءة الصامتة	قراءة نصوص نثرية وشعرية تدريبات صفية	2	4	b1,b2
3	مهارة الكتابة الوظيفية	كتابة الرسالة الإدارية تدريبات صفية	1	2	a1
4	الكتابة الوظيفية	كتابة التقرير تدريبات صفية	1	2	a1
5	اختبار نصف الفصل		1	2	a1, b1,b2
6	السيرة الذاتية	السيرة الذاتية تدريبات صفية	1	2	a5
7	مهارة ضبط الكتابة	القواعد النحوية (الجملة الاسمية ونواسخها) تدريبات صفية	2	4	b1,b2
8	مهارة ضبط الكتابة	القواعد النحوية (الجملة الفعلية ومكملاتها) تدريبات صفية	1	2	b1,b2
9	مهارة ضبط الكتابة	بعض القواعد الإملائية (همزتا الوصل والقطع - الهمزة المتوسطة - علامات الترقيم) تدريبات صفية	1	2	b1,b2
10	التذوق الأدبي	دراسة نصوص من الشعر العربي وتحليلها وتذوقها تدريبات صفية+ تكاليف	1	2	b1,b2
11	امتحان نهائي		1	2	a1, b1,b2
		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			

Teaching strategies of the course:

المحاضرة
المناقشات الحرة والعروض التوضيحية
القراءات التحليلية
التعلم الذاتي

حل المشكلات

Assignments:				
No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	كتابة التقرير	a1	5-12	10

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	1st- 15th week	5	5%	a1, b1,b2
2	Quizzes	5th - 12th week	5	5%	a1, b1,b2
3	Student assignment	5th - 12th week	10	10%	a5
4	Mid-term exam	7th or 8th week	20	20%	a1, b1,b2
5	Final exam	16th-17th week	60	60 %	a1, b1,b2
	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	-	-	-	-

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

Course Policies:	
	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
	Tardy: 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.
	Exam Attendance/Punctuality: 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.

	Assignments &Projects: Assignments and projects will be assessed individually unless the teacher request for group work
	Cheating: Cheating by any means will cause the student failure and he/she must re-study the course
	Plagiarism: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the college rules.


SECOND YEAR
FIRST SEMESTER

Course Specification of Pharmaceutical Calculations

I. Course Identification and General Information:							
1	Course Title:	Pharmaceutical Calculations					
2	Course Number & Code:						
3	Credit hours: 1hrs	C.H				Total	
		Theoretical	Practical	Training	Seminar		
		2				2	
4	Study level/ semester at which this course is offered:	Second year/First semester					
5	Pre –requisite (if any):						
6	Co –requisite (if any):	Pharmacy Orientation					
7	Program (s) in which the course is offered:	Bachelor of Pharmacy					
8	Language of teaching the course:	English					
9	The department in which the course is offered:						
10	Location of teaching the course:						
11	Prepared by:						
١٢	Date of approval:						

II. Course description:

The aim of the course is to acquire students with the principles of pharmaceutical calculations. In addition to managing proper and safe dispensing of medicine.

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

At the end of this course, the students will be able to:

1. Distinguish the methods of pharmaceutical calculation
2. Recognize the proper medical terminology, abbreviations and symbols in health reports and pharmacy practice
3. Calculate the proper dose of drugs for adults and pediatrics
4. Apply simple mathematical conversions for weight, volume, temperatures
5. Utilize the proper medical terminology, to communicate with other health care professionals

6. Employ proper calculations for preparation of different pharmaceutical preparations
7. Communicate effectively with patients and health care professionals
8. Work effectively as a part of a team to perform the required tasks

IV. Intended learning outcomes (ILOs) of the course:

(A) Knowledge and Understanding:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Knowledge and Understanding.

Program Intended Learning Outcomes (Sub-PILOs) in: Knowledge and Understanding		Course Intended Learning Outcomes (CILOs) in: Knowledge and Understanding	
After completing this program, students will be able to:		**After completing this course, students will be able to:**	
A1-	Recognize the principles of physical, clinical, social, behavioral, health and pharmaceutical sciences.	**a1-**	Distinguish the methods of pharmaceutical calculation
A4-	Recognize the pharmaceutical dosage form design and the quality control of pharmaceutical formulations according to GMP and pharmacopeial requirements to support the pharmaceutical industries and research.	**a2-**	Recognize the proper medical terminology, abbreviations and symbols in health reports and pharmacy practice

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Knowledge and Understanding to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Knowledge and Understanding		Teaching strategies/methods to be used	Methods of assessment
completing this course, students will be able to:		▪ Lectures brain storming and discussion	▪ Attendance, Quiz and project ▪ Written and oral exams
a1-	Distinguish the methods of pharmaceutical calculation		
a2-	Recognize the proper medical terminology, abbreviations and symbols in health reports and pharmacy practice		

(B) Intellectual Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Intellectual skills

Program Intended Learning Outcomes (Sub-PILOs) in Intellectual skills		Course Intended Learning Outcomes (CILOs) of Intellectual Skills	
After completing this program, students will be able to:		**After completing this course, students will be able to:**	
B3	Design different types of safe and effective pharmaceutical dosage forms and develop	**b1-**	Calculate the proper dose of drugs for adults and pediatrics

	novel methods of qualitative and quantitative analytical and biological analysis for pharmaceutical and biopharmaceutical products that support pharmaceutical research.		
B5	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.	**b2-**	Apply simple mathematical conversions for weight, volume, temperatures

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Intellectual Skills to Teaching Methods and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Intellectual Skills.		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		Lectures, solving problem, discussion and brain storm	Report, Written and oral exams
b1-	Calculate the proper dose of drugs for adults and pediatrics		
b2-	Apply simple mathematical conversions for weight, volume, temperatures		

(C) Professional and Practical Skills:

Alignment of 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 Practical Skills		Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills	
After completing this program, students will be able to:		**After completing this course, students will be able to:**	
C3-	Extract, isolate, purify, identify and formulate the natural products and assure their rational use	**c1-**	Utilize the proper medical terminology, to communicate with other health care professionals
C5-	Conduct research studies and utilize the results in different pharmaceutical fields	**c2-**	Employ proper calculations for preparation of different pharmaceutical preparations

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Professional and Practical Skills to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		- Lectures, discussion and brain storm	- Written and oral exams
c1-	Utilize the proper medical terminology, to communicate with other health care professionals		
c2	Employ proper calculations for preparation of different pharmaceutical preparations		

(D) General / Transferable Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: General and Transferable skills

Program Intended Learning Outcomes (PILOs) in General / Transferable skills		Course Intended Learning Outcomes (CILOs) in General / Transferable skills	
After completing this program, students will be able to:		**After completing this course, students will be able to:**	
D3	Develop financial, market management, writing, presentation and time management skills as well as creativity, critical thinking, problem solving and decision making abilities.	**d1-**	Communicate effectively with patients and health care professionals
		d2	Work effectively as a part of a team to perform the required tasks

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of 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 completing this course, students will be able to:		Lectures, discussion and brain storm	Written and oral exams
d1-	Utilize the proper medical terminology, to communicate with other health care professionals		
d2	Employ proper calculations for preparation of different pharmaceutical preparations		

V. Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1	Introduction Some fundamentals of measurement and pharmaceutical calculations	**a1, b1,c1**	Pharmacy definition, units arithmetic symbols, Fractions Ratios Length, weight and volume	**1**	**1**
2	The International System of Units Interpretation of prescription or medication order	**b1, c2,d1**	Metric system	**1**	**1**

			Common system The apothecaries,` Avoirdupois measure		
3	Household measures Reducing and enlarging formula	**a1, b2**	Applications	**1**	**1**
4	Density Specific gravity Specific volume	**a1, b2**	Applications	**1**	**1**
5	pharmaceutical measurement	**a1,a2,b1,c1,d1**	Weight and volume of liquids and percentage preparation	**1**	**1**
6	Percentage preparation Ratio strength Simple conversion from percentage to ratio strength	**a1,a2,b2,c2,d1**	Applications	**1**	**1**
7	Mid-term exam	**a1-2, b1-2, c1-2**		**1**	**1**
8	Dilution and concentration	**a1, b2**	Applications	**2**	**2**
9	Stock solution, Dilution	**a1, b2**	Applications	**1**	**1**
10	Allegation medial	**a1,b1,1**	Applications	**1**	**1**
11	Allegation alternate	**a1,b1,c2**	Applications	**1**	**1**
12	Calculation of pediatric dose according to body weight, age and body surface area	**a1,a2,b1,c2,d1**	Applications	**1**	**1**
13	Calculation of chemotherapeutic dose according to body weight, age	**a1,a2,c2,d1,d2**	Applications	**1**	**1**
14	Calculation of chemotherapeutic dose according to body surface area	**a1,a2, b2,c2,d1,d2**	Applications	**1**	**1**
15	Final-term exam	**a1-2, b1-2, c1-2**		**1**	**1**
Number of Weeks /and Units Per Semester				**16**	**16**

VI. a- Teaching strategies of the course:

Lecture method, Group Discussion, Problem solving sessions**,** tutorials and brainstorming.

b-Assessment Methods:

Oral Exam, Quizzes, Attendance, Participation, Short answers, reports, project, and Written exam

VII. Assignments:

No.	Assignments	Aligned CILOs (symbols)	Week Due	Mark

1	Homework Assignments	**a1-2, b1-2, d1-2**	Sporadic through the semester	**10**
2	Reports	**c1-2, d1-2**		

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs symbols)
1	Quizzes, Attendance, Participation,	All weeks	**5**	10%	**a1-2, b1-2, c1-2, d1-2**
2	Written Mid exam, Oral exam, reports, projects	2-14	**15**	30%	**a1-2, b1-2, c1-2**
3	Written Final exam	16th	**30**	60%	**a1-2, b1-2, c1-2**
	Total		**100**	**100%**	

IX. Students' Support:

Office Hours/week	Other Procedures (if any)
2 hours per week	

X. Learning Resource (MLA style or APA style)S:

1- Required Textbook(s) (maximum two)

1. A book prepared by the staff members
2. Howard C. Ansel.,2013, Pharmaceutical Calculation, Lippincott, (14th edition),William Wilkins .
3. Jones, D., 2008, "FASTtrack Pharmaceutics- dosage form and design" 1st edition, Pharmaceutical Press, London.
4. Aulton, M.E. (ed). (2013) Pharmaceutics, the design and manufacture of medicines. 4th edition, Churchill Livingstone, Edinburgh.

2- Recommended Readings and Reference Materials

Loyd, V Allen J.,2013, Remington: The Science and Practice of Pharmacy 22nd edition, Pharmaceutical Press, London.

3- Electronic Materials and Web Sites *etc*.

www.pubmed.com
http://www.sciencedirect.com

4- Other Learning Material:

J. Pharm. Sci

	Published articles related to the discussed topics United States Pharmacopeia and National Formulary (latest edition) United States Pharmacop Convention Inc., Rockville, MD. British Pharmacopoeia (latest edition), HMSO. London.

XI. Facilities Required:

1 - Accommodation:	- Well-equipped lecture halls with data show facilities, whiteboards, net connection, etc. - Well-equipped laboratories with all required equipment and reagents.
2 - Computing resources:	- Computer laboratory with internet facilities.

XII. 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 be 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 ▪ Peer rating and feedback ▪ Regular meeting of the Curriculum Committee of the faculty.
6- Course development plans	
	▪ Conducting regular workshops for the staff for improving their course specification skills. ▪ Regular revision of course specification and syllabus items.

XIII. Course Policies: (including plagiarism, academic honesty, attendance etc)

The University Regulations on academic misconduct will be strictly enforced. Please refer to ----------

1	**Class Attendance:** ▪ 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.
2	**Tardy:** - 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.
3	**Exam Attendance/Punctuality:** ▪ Exam attendance is obligatory unless being excused by the department and faculty. ▪ Absence from assignments or exams will be dealt with according to the general policy of the university.
4	**Assignments & Projects:** ▪ Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator. ▪ Projects: Not applicable.
5	**Cheating:** ▪ Punishment of cheating will be according to the general policy of the university in this respect.
6	**Plagiarism:** ▪ 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.
7	**Other policies:** ▪ General policies of the Students' Affairs of the University and the Quality Assurance Unit.

Course specification of Pharmaceutics I

Course Specifications

Department offering the programme: - pharmacy

Department offering the course: - Pharmaceutics

Academic year / Level second year /first semester

Date of specification approval

A- BASIC INFORMATION

Title: Pharmaceutics I Code:
Credit Hours: 3 hr Lecture:2 Practical:1 Total:

B- PROFESSIONAL INFORMATION

1 – OVERALL AIMS OF COURSE

1. To provide student with a detailed knowledge and understanding concerning preparation and controlling of various pharmaceutical dosage forms.

2. To provide the student with the knowledge about the theoretical principles outlined in the syllabus in relation to preformulation concepts, design and formulation of a different pharmaceutical dosage forms.

3. Ability in applying their theoretical knowledge to the formulation of proprietary dosage forms discussed in this syllabus and an understanding of the manufacturing processes involved in the preparation of these dosage forms.

2 – INTENDED LEARNING OUTCOMES OF COURSE (ILOS)

a- KNOWLEDGE AND UNDERSTANDING:

a1- To understand the relationship between chemical and physical properties of drugs as applied to drug formulation
a2- Explain the principles of preformulation of pharmaceutical dosage forms.
a3- Describe the characteristics of the liquid dosage forms and explain how these characteristics affect the action of the drug.
a4- Understanding the principles of design and formulation of pharmaceutical liquid dosage forms.
a5-Know and understand various methods for evaluation of pharmaceutical liquid dosage forms.
a6- Understanding the factors affecting drug and dosage form stability.
a7- Understanding the manufacturing process involved in the preparation of pharmaceutical liquid dosage forms.

b- INTELLECTUAL SKILLS

b1-Recognize the instability of pharmaceutical dosage forms when occurred.
b2-Identify the drug manufacturing relating problems and solve it.

b2-Manipulate the stability study data.

c- PROFESSIONAL AND PRACTICAL SKILLS

c1- Preparation of certain pharmaceutical dosage forms.
c2- perform quality control for pharmaceutical dosage form.
c3- Ability to formulate good and stable dosage form like suspension, emulsion and suspension.
c4- Design and perform stability studies for pharmaceutical dosage forms.

d- GENERAL AND TRANSFERABLE SKILLS

d1. Work separately or in a team to research and prepare a scientific topic.
d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.

3- Contents

	No. of hours	**Lecture**
Preformulation studies ▪ Study of physical properties of drug and its effect on formulation like • Physical form • Particle size • Shape • Density and angle of repose • Wetting • Dielectric constant • Solubility • Dissolution • Organoleptic properties ▪ Excipients compatibility ▪ Drug extraction ▪ Selection of solvent ▪ Maceration and percolation ▪ Common solvents used in pharmacy.	٦	2

▪		

Solution
• Introduction
• Classification of pharmaceutical solution
  • Aqueous solution
  • Non aqueous solution
• Formulation (vehicles used and additives)
• Isotonicity
• Stability of solution
• Manufacture of solution
	٩	3

Suspension • Advantages and disadvantages • Pharmaceutical application of suspension • Types of suspensions • Formulation of suspension • Difference between Flocculation, deflocculation. • Factors affecting sedimentation rate of suspension. • Formulation of various types of suspensions. • flocculating agents • Viscosity modifiers • Formulation additives • Stability testing of suspension	٩	3

Emulsion
• Emulsion types
• Emulsion uses
• Identification of emulsion type
• Emulsion formulation
  ▪ Choice of emulsion type, and oil phase
  ▪ Emulsion consistency
  ▪ Choice of emulsifying agent
• Preparation of emulsion
• Classification of emulsifying agents
• Stability of emulsion
• Stability testing of emulsion
	٩	3

Parenteral preparation
• Preformulation factors
  ○ Route of administration of injection
  ○ Water for injection
  ○ Pyrogenecity
  ○ Non-aqueous vehicles
  ○ Isotonicity and methods of adjustment
• Formulation details
  ○ Formulation of injection (the vehicles, osmotic pressure, pH, specific gravity, suspension for injection, emulsion for injection)
  ○ Containers and closures selection
• **Sterilization**
  ○ Importance
  ○ Methods
	٩	3

Total hours	**٤٢**	**14**

4– Teaching and Learning Methods

4.1- Lectures
4.2- Tutorials
4.3- Practical
4.4- visiting to pharmaceutical industry companies.

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Mid term exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding
5.4- Practical exam	to assess the practical skills.

Assessment Schedule

Assessment 1 midterm exam	Week 6
Assessment 2 practical	week 12
Assessment 3 final exam	Week 14

Weighting of Assessments

Mid-Term Examination	20	%
Final-term Examination	60	%
Practical Examination	20	%
Total	100	%

6- List of References

6.2- Essential Books (Text Books)

1. Aulton ME Pharmaceutics: The science of dosage form design Livingstone, 1988
2. Burns D M and MacDonald S G G Physics for biology and pre-medical students 2nd edn, Addison-Wesley, 1975
3. Collett D M and Aulton M E Pharmaceutical practice Churchill Livingstone, 1990
4. Martin A N and
5. 30th edn, Pharmaceutical Press, 1993
6. Parrott E L Pharmaceutical others Physical pharmacy 4th edn, Lea and Febiger, 1993
7. Martindale W The extra pharmacopoeia technology Burgess, 1970
8. Pharmaceutical Press The pharmaceutical codex 12th edn, Pharmaceutical Press, 1994
9. Shaw D J Introduction to colloid and surface chemistry 4th edn, Butterworths, 1992
10. Banker, G.S. & Rhodes, C.T. : Modern Pharmaceutics, Marcel Dekker Inc. New York and Basel.
11. Remington's Pharmaceutical Sciences.

Course specification of Analytical chemistry (I)

Prerequisite: pharmaceutical organic chemistry (I)

Aims (Module purpose):

This course is devoted to the exploration of principles of qualitative and quantitative analysis, methods expressing of the concentrations, principles of volumetric analysis, acid-base equilibria in aqueous and in nonequeous solutions, acid-base titration and their applications in both solutions.

Teaching methods:

Lectures and seminars.

Learning outcomes:

At the end of this module, student will be able to:

1. Have a rigorous background in those chemical principles that are of particular importance to analytical chemistry>
2. Be subjected to traditional techniques of analytical chemistry>
3. Acquire confidence in his/ her ability to obtain high quality analytical data.

Module Outline:

Week	subject
1	Course introduction; qualitative and quantitative analysis, role of analytical chemistry in pharmacy and medicine
2	Method of expression of concentrations (part1)
3	Method of expression of concentrations (part2)
4	Principle of volumetric analysis.
5	Applications involving molarity, normality and weight percent calculations.
6	Acid-base Equilibria in aqueous solution and pX concept(x: H^+, OH^-)
7	pH calculations.
8	Buffer solutions and physiological buffers.
9	Neutralization reactions; acid-base titrations, titration curve, factors affecting and theory of indicators.
10	Calculation involving applications.
11	Titration of polyprotic acids and polyequivalent bases.
12	Applications involving determinations of mixtures of acids and mixtures of basess.
13	Acid-base equilibria in nonequeous solution.
14	Titration curves and equivalent point determination.
15	Application involving ; carboxylic acids phenols and amines determinations.

Modes of assessment:

Mode of assessment	**Score**	**Date**
First exam	20	6^{th} week
Second exam	20	12^{th} week
Assignment/ Seminar//Project/Quizzes/tutorial	10	4^{th},5^{th},10^{th} and 11^{th} week
Final Exam (Comprehensive; written, verbal, hand –ins …etc..)	50	16thweek

Text book:

1. Analytical chemistry: principles and techniques.

2. By Larry G. Hargis.(editors) (December 17, 1996), publisher: Pearson Education POD; Facsimile edition ISBN:013033507X

3. In addition to the above, the students will be provided with handouts by the lecturer.

References:

Students will be expected to give the same attention to these references as given to the module textbook(s)

1. Analytical Chemistry bu Gary D. Christian publisher: Wiley; 6edition (March7,2003) ISBN:0471214728
2. Analytical chemistry (an introduction) by Skoog/West/Holler (edition)6th (1994), Saunders Golden SunBurst series, ISBN:0-03-097285.
3. Quantitative analysis by R.A-Day, JR, A.L-UNDERWOOD (editors) 6th edition (1991), prentice-Hall, ISBN:0-13-747361-3.
4. Quantitative analysis chemistry by James S. FRITZ, GOERG H. SCHENK (editors) 5th edition (1987), prentice-Hall, Englewood Clifts, ISBN:0-205-10480-0.
5. Analytical chemistry (principles) by john H. Kennedy (editor) 1st edition (1984), HARCORT BRACE JOANOVICH, ISBN: 0-150502700-x.

Course specification of Physiology I

COURSE SPECIFICATIONS:

- Programme (s) on which the course is given:
-Department offering the course: Physiology
Academic year \ level: - second year/first semester

BASIC INFORMATION:

Title: physiology I Code:
Credit Hours: 2 Lecture:
Tutorial: Practicals: Total:

PROFESSIONAL INFORMATION

1-AIMS OF THE COURSE:

1. Acquire an appropriate functional background of cells, tissues, organs& systems.
2. Integrate physiological data & mechanisms with the ongoing basic sciences: anatomy, histology& biochemistry and clinical applications.
3. Follow the rapidly changing and inflating details about molecular biology & genetics.
4. Explore in detail the functions of the autonomic, the neuromuscular, the respiratory and the cardiovascular systems as well as their integration to achieve homeostasis.
5. Develop the basic scientific research skills as well as effective communication and team work attitudes.

2-**INTENDED LEARNING OUTCOMES:**

a-KNOWLEDGE and UNDERSTANDING:

a1. Describe the cellular functions at the organelle and molecular level.
a2. Describe & explain the function of the nerve cell the nerve & muscle fiber grossly & the molecular level.
a3. Describe & explain function of the autonomic nervous system, different component of blood, the respiratory & cardiovascular system both grossly and molecular level.
a4. Describe some biophysical laws & their relation to physiology.

b-**INTELLECTUAL SKILLS**:

b1. Interpret the most important physiological laboratory results (blood, respiratory, neuromuscular), to distinguish a physiological from pathological condition.
b2. Comment, on some clinical parameters such as: ABP, ECG, nerve conduction velocity pulmonary functions for a normal individual.
b3. Integrate physiology with other basic and clinical sciences.

c-PRACTICAL SKILLS:

c1. Perform hematological tests: estimation of blood Hb, bleeding & clotting times & blood group.
c2. Perform the most important respiratory function tests.
c3. Perform the measurement of the arterial blood pressure.
c4. Manipulate a stethoscope for hearing heart & respiratory sounds.
c5. Record & read an electrocardiogram.
c6. Present physiological scientific data in a graphical form.

d-GENERAL SKILLS AND ATTITUDES:

d1. Work separately or in a team to research and prepare a scientific topic.

d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.
d3. Present physiological data in a graphical form.

3-COURSE CONTENTS:

Unit	Topic	No. of hours	Lecture
Cell	• Brief account on cell structure	2	1
Respiratory system	• Physiology of respiration. • Control of respiration • Hypoxia, cyanosis and dyspnea • Pulmonary function tests	4	2
Digestive system	• Function of digestive organs. • Movements of alimentary canal • Role of enzymes in digestive process	4	2
Nervous system	• Neurons • Synapses • Ganglion • Membrane potential • Impulse generation and conduction • Reflex arc • Function of central nervous system. • Autonomic nervous system	6	3
Muscular system	• Physiology of muscle contraction • Movement of muscles. • Muscular disorder	4	2
Urinary system	-Function of urinary organs. -Fluid & electrolytes balances.	4	2
Physiology of special senses	• Function of: Skin, Eye, Ear, Nose, and Tongue. • Physiology smell, taste, vision, hearing and pain.	4	2
	Total	28	14

Teaching and Learning Methods:
1- Lectures
2- Discussion

Student Assessment Methods:
1- Participation& semester work to assess intellectual skills
2- Midterm exam to assess the knowledge & understanding
3-Final term exam to assess the knowledge & understanding

Assessment schedule:
Assessment 1- Semester work weak 4
Assessment 2- Midterm exam weak 8
Assessment 3- Final term exam weak 18

Weighting of Assessments
-Semester work 10%
-Midterm exam 20%

-Final term exam	70%
Total	100%

6- List of References

6.1- Course Notes

Handout Texts

6.2- Essential Books (Text Books)

Guyton : Textbook of Medical Physiology

Ganong: Review of Medical Physiology.

Course specification for Anatomy

Course Specification

Programme	Bachelor
Department responsible for the course	Anatomy
Department teaching the course	Anatomy
Academic year	Second year /first semester
Date of specification approval	2015/2016

A-Basic information

Title	Human Anatomy			
Credit hours	Lecture	Practical	Total hours	No of weeks per semester
2+1	2	3	5	14

B- PROFESSIONAL INFORMATION

1-AIMS OF THE COURSE

For students undertaking this course, the aims are to:

1. To acquire an appropriate background about and recognize the normal structure and function of the body and of each of its major systems
2. To acquire an appropriate background about and understand different stages of the life cycle and how these affect normal structure and function
3. To Identify and examine the normal anatomy of the body and of each of its major organ systems grossly.
4. Mention and describe the different types of tissues
5. Demonstrate knowledge of the structure and function of the body and its major organ systems and of the molecular and cellular mechanisms

2-Intended Learning Outcomes:

A- Knowledge and Understanding:

A1) Describe course, relations and branches of main blood vessels of the body
A2) Describe course, relations and branches of main nerves of the body
A3) Describe the surface landmarks of the underlying bones, muscles and tendons, and internal structures (main nerves, vessels and viscera)
A4) Explain the different stages of human development, evolution and growth.
A5) Outline major clinical applications of anatomical facts
A6) Describe basic animal structure in terms of tissues and organ systems
A7) Outline the ways in which animals acquire nutrients and describe the structure and function of organs associated with this process

A8) Describe the functional capabilities of each tissue type and relate them to the structure.

B-Intellectual Skills:

B1- Interpret the normal anatomical structures on radiographs
B2- Interpret some clinical findings in relation to developmental basis
Correlate anatomical facts with the manifestation of various nerve injuries the body.
Distinguish aerobic and anaerobic respiration..

C-Practical Skills:

C1- Identify the important features of skeleton
C2- Identify the gross morphology of different body organs
C3- Identify the arrangement of various body organs and internal structures in their normal places (in cadavers and preserved specimens)
C4- Identify the surface anatomy of various arteries and nerves and other internal structures

D-General Skills and Attitudes:

D1.Work effectively both in a team, and independently on solving problems.
D2.Use internet and search for information.
D3.Communicate effectively with his teacher and colleagues.
D1.Write a scientific assay

3-COURSE CONTENTS:

Topic	No. of hours	No of Lectures
Skeleton • Structure and classification • Bones of upper and lower limb • Joints	**3**	**1**
Respiratory • Structure • The lungs and bronchioles	**3**	**1**
Digestive system • The mouth cavity • Esophagus • Stomach, liver spleen and pancreas • Intestine • Appendix • Rectum	**6**	**2**

Nervous system
• Structure and Classification
• Structure of spinal cord
• Spinal nerves
• The autonomic nervous system
  ○ Sympathetic
  ○ Parasympathetic
	6	**2**

Cardiovascular system • The heart	**3**	**1**

• Blood vessels		
Kidney • The kidney • Ureter • Urinary bladder	**3**	**1**
• **Anatomy of sense organs** ○ Eye ○ Ear ○ Nose ○ skin	**3**	**1**
• **Anatomy of endocrine glands** ○ Thyroid ○ Pancreas ○ Pituitary ○ Adrenal glands ○ Gonads	**3**	**1**
• **Reproductive system** • **Female:** ▪ The uterus ▪ The vagina ▪ The ovary ▪ Anatomy of the breast • **Male :** ▪ The testis ▪ Scrotum ▪ The penis	**3**	**1**

Course specification of Organic chemistry I

Level: Second year/ first semester
Credit hours: 3
Prerequisite : General Chemistry

Aims

1. The student at this level well know the principle of inorganic compounds studied in general chemistry.
2. This course will subject the students to the molecular orbital theoty of organic compounds, saturated aliphatic cyclic and cyclic hydrocarbons. Principles of the IUPAC nomenclature of organic compounds. Unsaturated aliphatic hydrocarbons.
3. Aliphatic halogen compounds. Isomerism and stereochemistry of organic compounds.
4. Aliphatic alcohols and ethers. Aliphatic amines and other nitrogen compounds.
5. Aliphatic acids and their derivatives. Aromaticity, Main groups of carbocyclic aromatic compounds. Polycyclic aromatic compounds. Electron rich and electron deficient heteroaomatic compounds.
6. The student will be able to study pharmaceutical biochemistry (I), because the student we know the organic functional groups and thee preparation and reactions.

Learning Outcomes:

At the end of this module, student will be able to:

1-Be able to nomenclate the different organic compounds.
2-Have a Knowledge of basic organic chemistry regarding synthesis and eactions of the main organic functional groups, organic stereochemistry.
3-Have a good understanding of organic sugar types.

Module outline:

LECTURE NO.	TOPIC
(1)	Introduction to organic compounds: ❑ Classification of carbon compounds: Aliphatic compounds, Alicyclic compounds, Aromatic compounds, Heterocyclic compounds. ❑ The structures and nomenclature of functional groups. ❑ Bonding in organic compounds: covalent bonding, co – ordinate boding, ionic bonding in organic compounds, and the hydrogen bond. ❑ Structure and physical properties of organic compounds: bond dissociation energy, polarity of bonds, polarity of molecules, melting points, intermolecular forces (Dipole – dipole interactions, hydrogen bonds, and Van Der Waals forces), boiling point, and solubility. ❑ Acids and bases: The Lowry – Bronsted definition, and the Lewis definition. ❑ Hybridization of atomic orbitals of carbon: carbon atom in the ground state and in the excited state, SP^3- Hybridization, SP^2 Hybridization, SP – hybridization, the formation of single, double, and triple bonds between carbon atoms, the structure of NH_3 and H_2O (SP3 – Hybridization).

(2)	Isomerism: Introduction and definition, structural isomerism (Definition, chain isomerism, position, isomerism, functional isomerism, Metamerism, Tautomerism), Stereoisomerism or stereochemistry (Definition, tetrahedral carbon atom, optical isomerism, polarized light, optical activity, specific optical rotation, polarimeter, chirality, enantiomerism, racemisation (definition, racemic modification preparation, and resolution of racemic modifications), Diastereomrism, Geometric isomerism (cis – and trans – isomers), Z/E isomerism, Meso compounds, Relativ and absolute configurations (definition, relative configurations D – and L -, absolute configurations R –and S -), number of stereoisomers, representation of configuration of enantiomers, (Fiscchers projection, Newmann's projection, Wedge projection, and Sawhorse projection Formulas), elements of symmetry (plane and centre of symmetry), optical isomerism without Asymmetric Atom.
(3)	Conformational Isomerism of Alkanes: Definition, Staggered, Eclipsed, and Gauche Conformers, Factors influencing the Conformational Stability (Torsional Strain, Steric Strain due to V
(4)	Alkanes (Paraffinic Hydrocarbons): Definition and Nomenclature, Structural Isomerism, Nomenclature of Functional groups, General methods of preparation, Naturally occurring Alkanes, Properties of Alkanes, General Reactivity, Halogenation, Oxidation, Dehydrogenation, Nitration, and Sulphonation of Alkanes
(5)	Alkenes-Double Bond (Olifinic Hydrocarbons): Definition, Nomenclature, Compounds of Biological interest which containDouble Bonds, General methods of preparation, Properties of Alkenes, General reactivity (Addition of Halogens, Addition of water and related compounds, Oxidation - Reduction of the Double Bond, Addition reactions ound to the substituted Double Bond and Markovnikov's Rule).
(6)	Dienes: Commulative Dienes (Synthesis and Reactions), Isolated Dienes (Synthesis and Reactions), Conjugated Dienes (Synthesis and Reactions).
(7)	Alkynes: Definition and Nomenclature, General methods of preparation, Reactions of Alkynes
(8)	Cyclic Aliphatic Hydrocarbons (Cycloalkanes):

	Definition, Nomenclature, Conformations of Cycloalkanes and their Stabilities, Factors influencing stability of conformation (Angle Strain Torsional Strain, Steric Strain, Dipole -dipole interactions), Conformations of Cyclohexane (Chair Conformation, and Boat Conformation), Equate and Axial Bonds in Cyclohexane, 1,3-Diaxial interactions in substituted Cyclohexane, Stereoisomerism in Cyclic Compounds (cis and trans-isomers), Enantiomers in Cyclic Compounds.
(9)	Chemical Reactions: General aspects of Chemical Reactions, Reaction Mechanism Classification of Organic Reactions (Substitution, Elimination, Addition to Multiple Bonds, Molecular Rearrangements), Classification of Organic Reagents (Nucleophiles, Electrophiles, and Free Radicals), Charge Distribution in Organic Molecules and Electronegativity, Inductive effect, Mesomeric Effect and -Electron Delocalisation and Resonance.
(10)	Energy Changes during Reactions: Bond Dissociation Energy, Heat of Reaction, Energy of Activation, Transition State, Progress of Reaction (Exothermic and Endothermic Reaction).
(11)	Aliphatic Nucleophilic Substitution Reactions: Definition, the Relationship between Nucleophilicity and Basicity, the SN^2 Mechanism, the SN^1 Mechanism, the Factors Favoring either SN^2 orSN^1 Reactions, Energetics of SN^1 and SN^2 Reactions, Stereochemistry of SN^1 and SN^2 Reactions, Mixed SN^1 and SN^2 Mechanisms, Transition between SN^1 and SN^2 Mechanisms, Factors influencing the Course of Substitution Reactions (Nature of the substrate, Nature of the Solvent, Nature of Nucleophile, Nature of the Leaving Group, the Neighbouring Group Participation).
(12)	Elimination Reactions: Elimination, - Elimination or 1,2-Elimination (Dehydrogenation, Dehydration Dehalogenation, and Dehydrohalogenation), E_1 and E_2 Mechanism Competition between E_2 and SN^2 Reactions, E_1cB Eliminations, Orientation of Double Bond

(13)	Alkylation: Definition, Perkin's Reaction, Knoevenagel's Reaction, Stobbe's Condensation, Michael's Addition Reaction, Cyanoethylation, Mannich's Reaction, Reformatsky's Reaction
(14)	Molecular Rearrangements: Definition, Pinacol's rearrangement, Wanger-Meerwein's rearrangement, Wolff rearrangement, Hofmann's rearrangement, Lossen's rearrangement, Beckmann's rearrangement, Claisen's rearrangement, Allylic rearrangement, Favorskii's rearrangement, Orton's rearrangement
(15)	Free Radical Reactions: Definition, Generation of Stable Free Radicals, Generation of Short-lived Free Radicals, Radical Coupling Reactions, Types of Free Radical Reactions (Radical Displacement, Radical Addition, Radical Substitution in Aromatic Systems).

Course specification of Immunology and serology

Level: 2nd year/first semester
Credit hours 3

1-Aims of this course

The course is designed to provide the students with knowledge about the microbial cell structure ,the major groups of microorganisms, normal flora pathogen city, immunology, autoimmunity and clinical microbiology , Which have been studied by students previously in pharmaceutical biochemistry.

2-Teaching Methods:

Lectures, tutorials and seminars

3-Learning Outcomes:

At the end of this module , student will be able to:

1. Understand the antigenic structure of all microorganisms
2. Understand the classification of microorganisms
3. Deal with infections. Pathogenecity and normal microbial flora.
4. Know the immune system and its disorders.

4- Course contents

lecture	subject
(1)	Immunology: a. Immunity. b. Antigen- Antibody reaction
(2)	Complement system Phagocytes & natural killer cells.
(3)	Immune response & hypersensitivity. Autoimmunity

Modes of Assessment:

Modes of Assessment	Score	Date
First Exam	20	6th week
Second Exam	20	12th week
Assignment/Seminar/Project/	10	4th , 5th , 10th and 11th
Final Exam (Comprehensive)	50	16th week

Text Books and Supporting Materials:

Text book:

Pharmaceutical Microbiology by Anthony Cundell.

References:

1-Pharmaceutical Microbiology by A.D. Russell, W.B Hugo (editor) publisher: Blackwell Science 3rd edition (December 1983) USBN: 0632010487
2-Medical Microbiology by Patrick Murray, Ken Rosenthal, G. Kobayashi, M, pfaller. Publisher: Mosby 4th edition (January 15 ,2002) ISBN: 0323012132
3-Clinical Microbiology Made Ridiculously Simple


SECOND YEAR /
SECOND SEMESTER

Course specification of Analytical chemistry (II)

Prerequisite: pharmaceutical organic chemistry (I)

Aims (Module purpose):

This course is devoted to the exploration of volumetric methods; precipitation Equilibria, Reduction – Oxidation Equilibria, Complex metric Equilibria- titration's and applications, also gravimetric methods.

Teaching methods:

Lectures and seminars.

Learning outcomes:

At the end of this module, student will be able to:

1. Have a rigorous background in those chemical principles that are of particular importance to analytical chemistry.
2. Be subjected to traditional techniques of analytical chemistry
3. Acquire confidence in his/ her ability to obtain high quality analytical data.

Module Outline:

Week	subject
1	Course introduction and refreshments for volumetric methods.
2	Precipitation Equilibria, factors affecting the solubility of the precipitate.
3	Applications involving calculations of sparingly soluble salts.
4	Deferent methods of titrations and their applications.
5	Titration curve determination.
6	Reduction – Oxidation Equilibria, types of electrochemical cells.
7	Electrode potential and types of electrodes.
8	Calculations concerning the application of Nernest equation.
9	Redox – titration, titration curve and factors the titration curves.
10	Iodi and iodo metric titrations and applications for determination of reducing and oxidizing agents.
11	Complexation Equilibria Complexation Equilibria complexing, types of agents and their conditions of applications.
12	Complexometric titrations involving EDTA
13	Applications of EDTA – titration methods
14	Gravimetric methods of analysis.
15	Application for the determination of deferent types of salts
16	Final Exam Week.

Modes of assessment:

Mode of assessment	Score	Date
First exam	20	6^{th} week
Second exam	20	12^{th} week
Assignment/ Seminar//Project/Quizzes/tutorial	10	4^{th},5^{th},10^{th} and 11^{th} week
Final Exam (Comprehensive; written, verbal, hand –	50	16thweek

Text book and supporting materials:

Text book:

1. Analytical chemistry: principles and techniques.[FACSIMILE] publisher: prentice Hall College Div; Facsimile edition (January 1, 1988) ISBN: 013033507X

2. Analytical chemistry: principles and techniques. By Larry G. Hargis.(editors) (December 17, 1996), publisher: Pearson Education POD; Facsimile edition ISBN:013033507X

In addition to the above, the students will be provided with handouts by the lecturer.

References:

Students will be expected to give the same attention to these references as given to the module textbook(s)

1. Analytical Chemistry by Gary D. Christian publisher: Wiley; 6edition (March7,2003) ISBN:0471214728
2. Analytical chemistry (an introduction) by Skoog/West/Holler (edition)6th (1994), Saunders Golden SunBurst series, ISBN:0-03-097285.
3. Quantitative analysis by R.A-Day, JR, A.L-UNDERWOOD (editors) 6th edition (1991), prentice-Hall, ISBN:0-13-747361-3.
4. Quantitative analysis chemistry by James S. FRITZ, GOERG H. SCHENK (editors) 5th edition (1987), prentice-Hall, Englewood Clifts, ISBN:0-205-10480-0.
5. Analytical chemistry (principles) by john H. Kennedy (editor) 1st edition (1984), HARCORT BRACE JOANOVICH, ISBN: 0-150502700-x.

Course specification of Physiology II

COURSE SPECIFICATIONS:

- Programme (s) on which the course is given:
-Department offering the programmes: -Department offering the course: Physiology
Academic year \ level: - second year/second semester
Date of specification approval:-

BASIC INFORMATION:

Title: physiology II Code:
Credit Hours: 2 Lecture:
Tutorial: Practicals: Total:

PROFESSIONAL INFORMATION

1-AIMS OF THE COURSE:

1. Acquire an appropriate functional background of cells, tissues, organs& systems.
2. Integrate physiological data & mechanisms with the ongoing basic sciences: anatomy, histology& biochemistry and clinical applications.
3. Follow the rapidly changing and inflating details about molecular biology & genetics.
4. Explore in detail the functions of the autonomic, the neuromuscular, the respiratory and the cardiovascular systems as well as their integration to achieve homeostasis.
5. Develop the basic scientific research skills as well as effective communication and team work attitudes.

2-**INTENDED LEARNING OUTCOMES:**

a-KNOWLEDGE and UNDERSTANDING:

a1. Describe the cellular functions at the organelle and molecular level.
a2. Describe & explain the function of the nerve cell the nerve & muscle fiber grossly & the molecular level.
a3. Describe & explain function of the autonomic nervous system, different component of blood, the respiratory & cardiovascular system both grossly and molecular level.
a4. Describe some biophysical laws & their relation to physiology.

b-**INTELLECTUAL SKILLS**:

b1. Interpret the most important physiological laboratory results (blood, respiratory, neuromuscular), to distinguish a physiological from pathological condition.
b2. Comment, on some clinical parameters such as: ABP, ECG, nerve conduction velocity pulmonary functions for a normal individual.
b3. Integrate physiology with other basic and clinical sciences.

c-PRACTICAL SKILLS:

c1. Perform hematological tests: estimation of blood Hb, bleeding & clotting times & blood group.
c2. Perform the most important respiratory function tests.
c3. Perform the measurement of the arterial blood pressure.
c4. Manipulate a stethoscope for hearing heart & respiratory sounds.
c5. Record & read an electrocardiogram.
c6. Present physiological scientific data in a graphical form.

d-GENERAL SKILLS AND ATTITUDES:

d1. Work separately or in a team to research and prepare a scientific topic.

d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.
d3. Present physiological data in a graphical form.

3-COURSE CONTENTS:

Unit	Topic	No. of hours	Lecture
Blood and lymph	• Composition and function of blood • Blood groups • Blood coagulation • Anemias • White blood cells and immunity • Lymph formation and function • Lymph channels	٦	٣
Cardiovascular system	• Heart • Structure and function of heart • Cardiac cycle (blood circulation) • Blood pressure and its regulation • ECG: methods of recording, normal record and common abnormalities.	٤	٢
Endocrine system	• Physiology of endocrine glands ○ Thyroid ○ Pancreas ○ Pituitary ○ Adrenal glands ○ Gonads	٦	٣
Reproductive system:	• Female: ▪ Functions of Vulva, monsveneris ▪ Functions of Labia major & minor ▪ Functions of Clitoris, Vestibule ▪ Functions of Hymen Bartholin glands. ▪ Function of Ovaries, Fallopian tube, Uterus, Vagina, menstrual cycle, menopause. ▪ Function of Breast. • Male : ▪ Function of semis and scrotum ▪ Functions of Testes, seminal fevous tubules ▪ Functions of Epidielymis, prostate glands ▪ Functions of Vas deferebces seminal vesicles. • Family planning methods • Sexually transmitted diseases	١٢	٦
	Total	٢٨	14

Teaching and Learning Methods:
1- Lectures
2- Discussion

Student Assessment Methods:

1- Participation& semester work	to assess intellectual skills
2- Midterm exam	to assess the knowledge & understanding
3-Final term exam	to assess the knowledge & understanding

Assessment schedule:

Assessment 1- Semester work	weak	4
Assessment 2- Mid term exam	weak	8
Assessment 3- Final term exam	weak	18

Weighting of Assessments

-Semester work	10%
-Midterm exam	20%
-Final term exam	70%
Total	100%

6.2- Essential Books (Text Books)

1. Guyton : Textbook of Medical Physiology
2. Ganong: Review of Medical Physiology.

Course specification of Pharmaceutics II

Course Specifications
Department offering the programme: - pharmacy
Department offering the course: - Pharmaceutics
Academic year / Level: second year/second semester
Date of specification approval

A- Basic Information

Title: Pharmaceutics II Code:
Credit Hours: 3 hr Lecture:2
Tutorial: Practical:1 Total:

B- PROFESSIONAL INFORMATION

1 – OVERALL AIMS OF COURSE

4. To provide student with a detailed knowledge and understanding concerning preparation and controlling of various pharmaceutical dosage forms.

5. To provide the student with the knowledge about the theoretical principles outlined in the syllabus in relation to preformulation concepts, design and formulation of a different pharmaceutical dosage forms.

6. Ability in applying their theoretical knowledge to the formulation of proprietary dosage forms discussed in this syllabus and an understanding of the manufacturing processes involved in the preparation of these dosage forms.

2 – INTENDED LEARNING OUTCOMES OF COURSE (ILOS)

a- KNOWLEDGE AND UNDERSTANDING:

A1- Understanding the principles of design and formulation of pharmaceutical aerosol dosage forms.
A2- Understanding the principles of design and formulation of pharmaceutical semisolid dosage forms.
A3- Understanding the manufacturing process involved in the preparation of pharmaceutical ophthalmic dosage forms.

b- INTELLECTUAL SKILLS

b1-Recognize the instability of pharmaceutical dosage forms when occurred.
b2-Identify the drug manufacturing relating problems and solve it.
b2-Manipulate the stability study data.

c- PROFESSIONAL AND PRACTICAL SKILLS

c1- Preparation of certain pharmaceutical dosage forms.
c2- perform quality control for pharmaceutical dosage form.
c3- Ability to formulate good and stable dosage form like ointments, creams and suppositories**.**
c4- Design and perform stability studies for pharmaceutical dosage forms.

d- GENERAL AND TRANSFERABLE SKILLS

d1. Work separately or in a team to research and prepare a scientific topic.

d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.

3- Contents

Topic	No. of hours	Lecture	Tutorial/ Practical
Ophthalmic preparation • Principles of ocular drug absorption. • Ophthalmic solution. • Ophthalmic suspension. • Ophthalmic ointments. • Ocuserts (ophthalmic inserts) • Examples of drugs used to treat certain eye diseases.	٩	٣	2

Therapeutic aerosols
• Definition and uses of therapeutic aerosols.
• Instability of aerosols
• Deposition of aerosols in the human respiratory tract.
• Formulation and generation of aerosols
  ○ Pressurized packages
  ▪ Type of propellants
  ▪ Containers
  ▪ Formulation aspects
  ▪ Performance of pressurized packages as inhalation aerosol generators
  ○ Air-blast nebulizers
  ○ Dry powder generators
• Methods of preparation
• Evaluation methods
  ○ Leaking and pressure testing of containers.
  ○ Output, drug concentration and dose delivered
  ○ Size analysis
	٩	٣	-

Semisolid dosage forms • Skin anatomy and physiology • Percutaneous absorption and factors affecting it. • Ointments ▪ Classification of ointment bases ▪ Additives included in ointment bases ▪ Methods of Preparation of ointments and packaging. ▪ Some examples of medicated ointments • Creams ▪ definition ▪ Classification of creams ▪ Some examples of medicated creams • Pastes ▪ Definition ▪ Composition ▪ Examples of medicated pastes • Gels ▪ Composition and uses • Evaluation of drug release from ointment and cream bases.	١٥	٥	6
Suppositories • Introduction • Advantages and disadvantages • Anatomy and physiology of rectum • Factors affecting rectal drug absorption. • Shapes and size of suppositories. • Types of suppository bases. • Methods of Preparation of suppositories. • Displacement value • Calibration of suppository mould with bases.	٩	٣	4
Total hours	٤٢	١٤	12

4– Teaching and Learning Methods

4.1- Lectures
4.2- Tutorials
4.3- Practical
4.4- visiting to pharmaceutical industry companies.

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Midterm exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding
5.4- Practical exam	to assess the practical skills.

Assessment Schedule

Assessment 1 midterm exam	Week 6
Assessment 2 practical	week 12
Assessment 3 final exam	Week 14

Weighting of Assessments

Mid-Term Examination	20	%
Final-term Examination	60	%
Practical Examination	20	%
Total	100	%

6.Essential Books (Text Books)

1. Aulton ME *Pharmaceutics: The science of dosage form design* Livingstone, 1988
2. Burns D M and MacDonald S G G *Physics for biology and pre-medical students* 2nd edn, Addison-Wesley, 1975
3. Collett D M and Aulton M E *Pharmaceutical practice* Churchill Livingstone, 1990
4. Martin A N and others *Physical pharmacy* 4th edn, Lea and Febiger, 1993
5. Martindale W *The extra pharmacopoeia* 30th edn, Pharmaceutical Press, 1993
6. Parrott E L *Pharmaceutical technology* Burgess, 1970
7. Pharmaceutical Press *The pharmaceutical codex* 12th edn, Pharmaceutical Press, 1994

Shaw D J *Introduction to colloid and surface chemistry* 4th edn, Butterworths, 1992

Course specification for Histology

Course Specification

Programme	Bachelor
Department responsible for the course	Anatomy
Department teaching the course	Anatomy
Academic year	First /second semester
Date of specification approval	2015/2016

A-Basic information

Title	Human Histology			
Credit hours	Lecture	Practical	Total hours	No of weeks per semester
2+1	2	3	5	14

B- PROFESSIONAL INFORMATION

1-AIMS OF THE COURSE

For students undertaking this course, the aims are to:

6. To acquire an appropriate background about and recognize the normal structure and function of the body and of each of its major systems
7. To acquire an appropriate background about and understand different stages of the life cycle and how these affect normal structure and function
8. To Identify and examine the normal anatomy of the body and of each of its major organ systems grossly.
9. Mention and describe the different types of tissues
10. Demonstrate knowledge of the structure and function of the body and its major organ systems and of the molecular and cellular mechanisms

2-Intended Learning Outcomes:

A- Knowledge and Understanding:

A9) Describe course, relations and branches of main blood vessels of the body
A10) Describe course, relations and branches of main nerves of the body
A11) Describe the surface landmarks of the underlying bones, muscles and tendons, and internal structures (main nerves, vessels and viscera)
A12) Explain the different stages of human development, evolution and growth.
A13) Outline major clinical applications of anatomical facts
A14) Describe basic animal structure in terms of tissues and organ systems
A15) Outline the ways in which animals acquire nutrients and describe the structure and function of organs associated with this process
A16) Describe the structural characteristics of the four basic tissue types

A17) A8- Describe the functional capabilities of each tissue type and relate them to the structure.

B-Intellectual Skills:

B1- Interpret the normal anatomical structures on radiographs
B2- Interpret some clinical findings in relation to developmental basis
Correlate anatomical facts with the manifestation of various nerve injuries the body.
Distinguish aerobic and anaerobic respiration..

C-Practical Skills:

C1- Identify the important features of skeleton
C2- Identify the gross morphology of different body organs
C3- Identify the arrangement of various body organs and internal structures in their normal places (in cadavers and preserved specimens)
C4- Identify the surface anatomy of various arteries and nerves and other internal structures

D-General Skills and Attitudes:

D4.Work effectively both in a team, and independently on solving problems.
D5.Use internet and search for information.
D6.Communicate effectively with his teacher and colleagues.
D2.Write a scientific assay

3-COURSE CONTENTS:

Topic	No. of hours	No of Lectures
1. Introduction to histology-types of tissues **2. Epithelium:** - General characteristics of epithelium & its types - Types of simple epithelium (structure & sites) - Structure & sites of stratified squamous & stratified columnar epithelium - Glandular epithelium with reference to sites - Neuro- and myo-epithelium with reference to sites - General functions of epithelium - Modifications of epithelial cells surfaces: Apical, basal & lateral modifications - Basement membrane **3. Connective Tissue:** - General characteristics - Cells of C.T. proper (LM, EM & functions) - Fibers of C.T. - Ground substance - Types of C.T. proper with reference to sites - General functions of C.T. proper - Adipose Tissue **4. Cartilage:** - Types of cartilage - Histology of each type - Sites of each type	**3** **3** **3**	**1** **1** **1**

- General functions **5. Bone:** - Types of bone with reference to sites - Methods of preparation of bone section - Bone cells & their functions - Intercellular substance (components & chemical composition) - Histology of compact bone - Histology of spongy bone - Differences between cartilage & bone - Ossification (intramembranous & intracartilagenous) **6. Blood & Hemopoiesis:** - Components of Blood - Staining of blood cells - Normal structure, size & number of erythrocytes , ultrastructure & functions - Abnormalities in structure, size & number of RBCs - Polycythaemia & anaemia and their causes - Types of WBCs & normal percentage of each - Total RBCs count - Total leucocytic count & its clinical importance - Differential leucocytic count & its importance - Structure (LM & EM) & function of WBCs - Structure (LM & EM) & function of platelets - Types & structure of bone marrow - Erythropoiesis - Granulopoiesis - Development of lympocytes - Development of monocytes - Development of platelets **7. Muscle Tissue:** - General histological characteristics and types of muscle tissue - Skeletal muscle fibers (LM , EM) & molecular structure - Types of skeletal muscle fibers - Mechanism of muscle contraction - Smooth muscle fibers (LM & EM) - Cardiac muscle fibers (LM & EM) - Conducting system of heart **8. Nerve Tissue:** - Types (classification) of neurons & examples - EM of nerve cell body (Perikaryon) Dendrites & axons - Types of nerve fibers with examples - Histology of peripheral nerve fibers - Structure of nerve trunk - Spinal & autonomic ganglia - Synapse	**3**	**1**

- Degeneration & Regeneration of nerve fibers - Neuroglia (Definition, Classification & Sites) - Structure & function of proper neuroglia cells **9. Vascular System:** - General structure of blood vessels & its significance - Large, medium sized & small arteries - Small, medium sized & large veins - Types, sites & structure of Arteriovenous connections **10. Lymphatic (Immune) System:** - Cells involved in the immune system & their functions - Antigen presenting cells - Primary & secondary immune response - Cellular & Humoral immunity - Lymph vessels & distribution of lymphoid tissue - Structure of Lymph node & its immunological function - Structure of Spleen & its function - Differences between lymph node & spleen - Blood supply of spleen & theories of circulation - Structure of Tonsils - Structure & functions of thymus		
Total	**42**	**14**

25. Teaching and Learning Methods:

1. Lectures
2. Discussion
3. Lab. Work

26. Student Assessment Methods:

Multiple choice questions, short and long questior	To assess knowledge and theoretical context.

27. Assessment schedule:

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Weighing of Assessments
Assessment 1	Midterm theoretical examination	7	30%
Assessment 2	Final theoretical exam	15-16	70%
Total			100%

8- Facilities Required for Teaching and Learning

3. White board & Markers.
4. Over head projector.
5. Lab

Course specification of psychology and medical sociology

Course Outline:

No.	subject
1	Psychological principles.
2	Personality.
3	Biological basic of behavior
4	Mental processes: a. Sensation b. Conceit c. Emotion
5	Mental abilities
6	Motor skills
7	Motives
8	Psychological health
9	Psychotherapy
10	Behavioral medicine
11	The principles of medical sociology
12	Sociology of medicine
13	Sociology of hospital
14	Preventive method
15	Professional medicine
16	Psychological and social medicine
17	Social welfare


THIRD YEAR /
FIRST SEMESTER

Course specification Pharmaceutics III

Course Specifications
Department offering the programme: - pharmacy
Department offering the course: - Pharmaceutics
Academic year / Level third year /first semester

A- Basic Information

Title: Pharmaceutics III Code:
Credit Hours: 3 hr Lecture: 2 Practical:1 Total:

B- PROFESSIONAL INFORMATION

1 – OVERALL AIMS OF COURSE

1. To provide student with a detailed knowledge and understanding concerning preparation and controlling of various pharmaceutical dosage forms.
2. To provide the student with the knowledge about the theoretical principles outlined in the syllabus in relation to preformulation concepts, design and formulation of a different pharmaceutical dosage forms.
3. Ability in applying their theoretical knowledge to the formulation of proprietary dosage forms discussed in this syllabus and an understanding of the manufacturing processes involved in the preparation of these dosage forms.

2 – INTENDED LEARNING OUTCOMES OF COURSE (ILOS)

d- KNOWLEDGE AND UNDERSTANDING:

a1- mention solid dosage form formulation
a2- Explain the principles of formulation of pharmaceutical solid dosage forms.
a3- Describe the characteristics of the solid dosage forms and explain how these characteristics affect the action of the drug.
a4- Understanding the principles of design and formulation of pharmaceutical solid dosage forms.
a5-Know and understand various methods for evaluation of pharmaceutical solid dosage forms.

e- INTELLECTUAL SKILLS

b1-Recognize the problems encountered during formulation of pharmaceutical dosage forms when occurred.
b2-Identify the drug manufacturing relating problems and solve it.

f- PROFESSIONAL AND PRACTICAL SKILLS

c1- Preparation of certain pharmaceutical dosage forms.
c2- perform quality control for pharmaceutical dosage form.
c3- Ability to formulate good and stable dosage form like tablet, capsule and sustained releases dosage forms**.**

g- GENERAL AND TRANSFERABLE SKILLS

d1. Work separately or in a team to research and prepare a scientific topic.

d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.

3- Contents

TOPIC	No. of hours	Lect	Prac.
Powder and granules • Types of powders • Advantages and disadvantages of powders, • Cachets and Tablet triturates. • Preparation of different types of powders encountered in prescriptions. • Weighing methods, possible errors in weighing • Minimum weighable amounts and weighing of material below the minimum weighable amount • Geometric dilution and proper usage and care of dispensing balance. • Granules • Effervescent granules ▪ Formulation ▪ preparation	٦	2	2
Tablets • **Compressed tablets** ▪ Introduction ▪ Advantages and disadvantages.\ ▪ Types of compressed tablets. ▪ Tableting methods o Direct compression o Dry granulation o Wet granulation ▪ Technology of production of granules on large scale by various techniques. ▪ Tablet excipients ▪ Large scale production of tablets. ▪ Tablet press machines ▪ Problems encountered during tablet formulation. ▪ Standards quality control tests for tablets. ▪ Tablet coating o Types of coating o Film forming materials o Common polymers used for tablet coating. o Formulation of coating solution o Equipments for coating o Coating process evaluation of coated tablets.	١٢	4	5

Capsules • **Hard and soft gelatin capsules** ▪ Hard gelatin capsules ○ Advantages and disadvantages ○ Composition of capsule shell ○ Selection of capsule size. ○ Excipients used in hard gelatin capsule formulation. ○ Enteric coating of capsules. ○ Capsule filling process. ○ Storage of hard gelatin capsules. ▪ Soft gelatin capsules ○ Advantage and disadvantages. ○ Capsule shell composition. ○ Shapes and sizes. ○ Soft gelatin capsule formulation. • Soft gelatin capsule filling process.	٩	3	3
Sustained dosage forms • Introduction. • Advantages and disadvantages. • Drugs that can be good candidates for sustained release formulation. • Methods to obtain sustained release ○ Pharmaceutical ○ Chemical ○ Biopharmaceutical	٦	2	2
Microencapsulation • Types of microcapsules • Importance of microencapsulation in pharmacy, • Microcapsulation by ○ Phase separation co-acervation multiorifice ○ Spray drying ○ Spray congealing ○ Polymerization ○ Complex emulsion ○ Air suspension technique ○ Coating pan and other techniques.	٩	3	-
Total hours	**٤٢**	**14**	**12**

4– Teaching and Learning Methods

4.1- Lectures
4.2- Tutorials
4.3- Practical

5- Student Assessment Methods

5.1- Participation& semester work to assess intellectual skills

5.2- Mid term exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding
5.4- Practical exam	to assess the practical skills.

Assessment Schedule

Assessment 1 midterm exam	Week 6
Assessment 2 practical	week 12
Assessment 3 final exam	Week 14

Weighting of Assessments

Mid-Term Examination	20	%
Final-term Examination	60	%
Practical Examination	20	%
Total	100	%

6- List of References

6.1- Course Notes

6.2- Essential Books (Text Books)

12. Aulton ME *Pharmaceutics: The science of dosage form design* Livingstone, 1988
13. Burns D M and MacDonald S G G *Physics for biology and pre-medical students* 2nd edn, Addison-Wesley, 1975
14. Collett D M and Aulton M E *Pharmaceutical practice* Churchill Livingstone, 1990
15. Martin A N and others *Physical pharmacy* 4th edn, Lea and Febiger, 1993
16. Martindale W *The extra pharmacopoeia* 30th edn, Pharmaceutical Press, 1993
17. Parrott E L *Pharmaceutical technology* Burgess, 1970
18. Pharmaceutical Press *The pharmaceutical codex* 12th edn, Pharmaceutical Press, 1994
19. Shaw D J *Introduction to colloid and surface chemistry* 4th edn, Butterworths, 1992
20. Banker, G.S. & Rhodes, C.T. : *Modern Pharmaceutics*, Marcel Dekker Inc. New York and Basel.
21. *Remington's Pharmaceutical Sciences*.

Course specification of Organic Chemistry (III)

Credit hours: 3
Prerequisite : Pharmaceutical Organic Chemistry II

Aims (Module Purpose):

After completion of pharmaceutical organic chemistry (II) and it's fundamentals, in particular the organic functional groups, this course will provide a comprehensive and sound understanding of the aromatic compounds and their preparations, reactions and IUPAC nomenclature, in this course the student will study the nitrogen compounds, arylhalid,. Phenol and sulphonic acid and their derivatives.

student will know the organic functional groups and thee preparation and reactions.

Teaching Methods:

Lectures and seminars.

Learning Outcomes:

At the end of this module, student will be able to:
1-Be able to nomenclate the different organic compounds.
2-Have a Knowledge of basic organic chemistry regarding synthesis and eactions of the main organic functional groups, organic stereochemistry.
3-Have a good understanding of organic sugar types.

Module outline:

Week	Subject
(1)	Amines: Definition, Classification, Nomenclature, General Methods of Preparation, Physical Properties, Chemical Properties (Basicity and Salt Formation, Alkylation, Conversion into Amides, Reaction with Nitrous Acid, Ring Substitution in Aromatic Amines, Basicity of Amines, Effect of Substituents on the Basicity of Aromatic Amines, Exhaustive Methylation of Amines and Hofmann Elimination, Cope Elimination).
(2)	Aryl Halides: Definition, Nomenclature, Methods of preparation, Physical properties, Chemical properties (Formation of Grignard reagents, Nucleophilic Aromatic Substitution, replacement by -OH group, replacement by - NH_2 group), The Mechanism of Nucleophilic Aromatic Substitution, Nucleophilic Substitution of Substituted Aryl Halides, Electrophilic Aromatic Substitution, Other Reactions (Wurtz-Fitting Reaction, Ullman Synthesis), The Influence of Substituents on Reactivity in Nucleophilic Aromatic Substitution (Electron-releasing groups, Electron-withdrawing groups), Influene of substituents on orientation in Nucleophilic Aromatic substitution Comparison of Aliphatic and Aromatic Nucleophilic substitutions

(3)	Nitro Compounds: Structure of Nitro Group, The Importance of Nitro Compounds, General Methods of Preparation (Aliphatic and Aromatic), Reactions of Nitro Compounds (Electrophilic and Nucleophilic Substitutions, Reduction under Different Conditions).
(4)	Diazonium Salts: Definition, Nomenclature, Methods of Preparation, The Mechanism of Diazotisation, Physical Properties, Chemical Properties (Replaceme -CI, -Br or -CN Sandmeyer's Reaction, Replacement by -I, Replacement by -F, Replacement by -OH, Replacement by -H, Replacement by Aryl Group, Reduction to Hydrazines, Coupling with Tertiary Amines, Reactiions of Primary and Secondary Amines.
(5)	Phenols: Definitions, Nomenclature, Preparations of Phenols, Physical Properties and Hydrogen Bonding, Chemical Properties (Acidity and Effect of Substituents on Acidity of Phenols, Ether Formation-Williamson Synthesis, Ester Formation, Halogenation, Nitration, Sulphonation, FriedelAlkylation and Acylation, Koble Reaction, and Reimer-Tiemann Reaction, Phthalein Reaction with Ferric Chloride).
(6)	Sulphonic Acids and Their Derivatives: Definition, Nomenclature, Preparations, Physical Properties, Chemical Properties (Reactions due to lonisable Hydrogen, acidity, salt formation, Formation of Functional Derivatives, formation of sulphonyl chlorides, Replacement of Sulphonic Acid Group by -H, by -OH Group, by -NH Group, Reactions of Aromatic Nucleus, Derivatives of Sulphonic Acid (Chloramine T, Halazone, Saccharin, Sulphanilamide)

Modes of Assessment:

Modes of Assessment:	Score	Date
Fist Exam	20	6th week
Second Exam	20	12th week
Assignment / Seminar /Project	10	4th , 5th , 10th and 11th week
Final Exam (Comprehensive: written, verba ,hand-ins …etc…)	50	16th week

*Make-up exam will be offered for valid reasons only with consent of the Dean.

Make-up exam may be different from regular exam in content and format. *

Attendance Policy:

Lecture attendance is mandatory _Student is allowed maximally 15% absentia of the total module hours. According to the rules you are allowed to be absent maximum for 7 hours . More than this percentage, student with an excuse will be drawn from the module. Otherwise, student will be deprived from the module with zero mark assigned

Expected Workload

On average you should expect to spend at least (9) hours per week on this module.

Text Books and Supporting Materials:

Text book:

Organic chemistry: A short course by Harold Hart, Leslie E. Craine, David J. Hart, publisher: Houghton Miffin college; 10th edition (January 1999) ISBN: 0395902258.

In adition to the above , the students will be provided with handouts by the lecturer.

References:

Students will be expected to give the same attention to these references as given to the Module textbook(s)

1-Organec Chemistry : A Short Course. By Harold Hart, Leslie E. Craine, David J. Hart. Publisher: Houghton Mifflin College: 10th edition (January 1999) ISBM: 0395302258

2- Introduction to Organic Chemistry (Study guide & Solutions Manual).by Andrew Streitwieser, Clayton H. Heathercock. Edward M. Kosowe. Publisher: Prentice Hal college Div : (December 1998) ISBN :0130129909

3- Organic Chemistry . by: T.W . Graham Solomons, 8th edition ,2003.

Course specification of Pharmacognosy I

Course specifications
Programme(s) on which the course is given: Bachelor Degree in Pharmaceutical Sciences
Department offering the course: Pharmacognosy
Academic year / Level: second year /first semester

A- Basic Information

Title: Pharmacognosy
Credit Hours: 3/week
Lecture: 2/week
Practical: 2/week
Total: 5/week

B- Professional Information

1 – Overall aims of course

Upon successful completion of this course, the students should be able to

1. Illustrate the morphological and histological structures of different organs of
2. Medicinal plants such as seeds, fruits, roots and rhizomes. The students should
3. Be also able to discuss role of these medicinal plants in the treatment of different
4. Disease conditions are also studied.
5. The student in this end of this course will be able to identify many medicinal
6. Plants microscopically in both their entire and powdered forms.

2 – Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:

The student should be able to

1. Describe the histological structure of the different medicinal plant parts, seeds, fruits, roots and rhizomes.
2. Give an account on the biologically active principles in each plant part (seeds, fruits, roots and rhizomes) as well as their biological activity.

b- Intellectual skills

The student should be capable of:

1. Determine unknown drugs seeds, fruits, roots and rhizomes.. (morphologically and microscopically)
2. Judge whatever the powdered drug is related to seeds, fruits, roots and rhizomes.

c- Professional and practical skills

The student should be capable of:

1. Use the microscope to decide a given unknown plant powder is related to seeds, fruits, roots and rhizomes.
2. Design and perform experiments for detection of adulteration

d- General and transferable skills

The student should be able to:

1. Work effectively in team.
2. Demonstrate written and oral communication skills.

3- Contents

1. **-Introduction to seeds.**
    a. -Strophanthus seed.

b. -Nux vomica seed.
c. -Stramonium seed.
d. -Colchicum seed.
e. -Cardamom seed.
f. -Nutmeg seed.
g. -Black mustard seed.
h. -White mustard seed.
i. -Almond seed.
j. -Linseed.
k. -Fenugreek.
l. -Plantago seed.
m. -Castor seed.

2. -Introduction to fruits

a. -Umbelliferous fruits
b. -Fennel.
c. -Anise
d. -Coriander
e. -Ammi visnaga.
f. -Ammi majus
g. -Caraway.
h. -Dill.
i. -Cumin.
j. -Celery.
k. -Hemlock.
l. Black pepper.
m. -Colocynth.
n. -Senna pod.
o. -Juniper.
p. -Star anise.
q. Lemon peel.
r. -Bitter orange peel.
s. -Hops.
t. -Vanilla.
u. -Ccapsicum.
v. -Poppy
w. ntroduction to
x. subterranean organs
y. (roots & rhizomes)
z. Rhizomes:
aa. -Filix mass.
bb. -Veratrum.
cc. -Valerian.
dd. -Rhubarb.
ee. -Podophyllum.
ff. -Hydrastis.
gg. -Ginger.
hh. -Galengal.

ii. -Turmeric.
jj. -Orris.
kk. -Calmus
ll. -Colchicum.

3. **Root:**
   a. -Liquorice.
   b. -Ipecacuanha
   c. -Dandelion.
   d. -Krameria.
   e. -Derris.
   f. -Rauwolfia.
   g. -Alkanna.
   h. -Senega.
   i. -Calumba.
   j. -Althea.
   k. -Marshmallow.
   l. -Gentian.
   m. -Belladonna.
   n. -Jalap.
   o. -Scammony.
   p. -Aconite.
   q. -Sasaparilla.

4– Teaching and learning methods

4.1- Lectures (Tools: board, overhead projector, data show). The lectures were added on the internet site of the faculty to be available to the students all the time as an *e*-learning.
4.2- Practical Session (Tools: labs.,boards, instruments, chemicals, glasswares, equipments).
4.3- Assignments, seminars, researches and posters.

5- Student assessment methods

5.1- Written exam(s) **to assess** knowledge and understanding and intellectual skills.
5.2- Practical exam(s) **to assess** practical skills.
5.3- Periodic exam(s) **to assess** understanding and intellectual skills.
5.4- Oral exam **to assess** knowledge and understanding and intellectual skills.

Weighting of assessments

Periodic Examination	10%
Final-Term Written Examination	50%
Practical Examination	20 %
Oral Examination.	20%
Total	100%

6- List of references

6.1- Course notes

Lecture and practical notes prepared by instructors

6.2- Essential books (text books)

……..

6.3- Recommended books

1. Trease, G.E.& Evans, W.C.; “Pharmacognosy”, W.B. Saunders Publishers, Ltd, 15th ed., 2002.

6.4- Periodicals, Web sites, … etc

Course specification of Biochemistry1

Course Specifications
Department offering the program: Medical Biochemistry Department
Department offering the course: Medical Biochemistry Department
Academic year / Level *third year/ first semester*

A- Basic Information

Title: Biochemistry and molecular biology
Credit Hours: 3hr lecture:1
Practical: 1

B- Professional Information

1 - Overall Aims of Course

2 To gain an overview of Medical Biochemistry specialty e.g., its philosophy, features and methods.
3 To help students to become familiar with the biochemical knowledge and skills necessary to understand other related subjects.
4 To provide the students with an appropriate exposure to the medical biochemistry discipline this will assist students in understanding biochemical alteration in health and disease.
5 To provide students with good knowledge about structure and function of carbohydrate, lipids and proteins.
6 To provide an explanation of the relationship between the three-dimensional structure of macromolecules and their biological activities.
7 Course Specifications 2005-2006
8 To enable the students to be oriented with structure and biochemical importance of vitamins as well as the structure, functions and kinetics of enzymes.
9 To enable the students to be oriented with concepts of molecular biology and how this field gave us a new perspective and new technology used in the diagnosis, treatment and new drugs design.

2 - Intended Learning Outcomes of Course (ILOs)

a- Knowledge and Understanding:

al- Define the structure and function of carbohydrates, lipids, proteins, nucleotides and enzymes.
a2- Illustrate the mode of action and kinetics of enzymes and their role in the diagnosis of diseases.
a3- Illustrate structure and role of vitamins derivatives as coenzymes needed in the activity of enzymes.
a4- Point out diseases produced by vitamins deficiency and their clinical prints on the biochemical and molecular basis.
a5- Describe the biological transport and cell membrane and their biochemical, clinical and laboratory importance.
a6- Describe DMA structure, replication, mutation and repair.

b- Intellectual Skills

bl- Interpret symptoms, signs and biochemical laboratory findings of some vitamins deficiency disease.
b2- Interpret some plasma proteins electrophoresis
b3- Point out the clinical significance and some enzymes reactions and kinetics
b4- Point-out the application of molecular biology in basic and clinical sciences

c- Professional and Practical Skills

cl- Identify laboratory reagents and instruments used in biochemistry laboratory.
c3- Perform chemical tests to study the properties of lipids and fatty acid.
c5- Estimation of total plasma proteins.
c6- Identify of unknown solutions.

d- General and Transferable Skills

dl- The student is able to work effectively in a group in lab or during preparation of seminars.
d2- The student respects the role of staff and co-staff members regardless of degree or occupation.

3- Contents

Course contents

1) PHYSICO CHEMICAL PRINCIPLES:

Molecular structure of water - .Different types of bonds -Solution-OH and pH- acids and bases-Normal and molar solutions-Buffers and physiological buffers-osmotic pressure and surface tension- Adsorption and elution and dialysis – Diffusion expression of concentration.

2) CARBOHYDRATES:

1. Definition, functions and classification: Monosaccharide, disaccharides and polysaccharides
2. Monosaccharides: Classification, structures and physical and chemical properties. Sugars exhibit various forms of isomerism.
3. Monosaccharides of physiological importance: glucose, fructose, galactose and mannose.
4. Glycoside formation with each other and with other compounds.
5. Sugar derivatives of importance: sugar acids, sugar alcohols, aminosugars and deoxysugars.
6. Disaccharides: maltose, sucrose, and lactose.
7. Polysaccharides starch, glycogen, cellulose and insulin.
8. Glycosaminoglycans (mucopolysaccharides): Structure, function and classification.
9. Glycoproteins (mucoproteins) proteoglycan.

3-LIPIDS:

1. Lipids of physiological functions: Definition, classification and general function.
2. Fatty acids: Saturated and unsaturated w3 and w6 PUFA, OH fatty acids and methyl fatty acids.
3. Triacylglycerol the main storage form of lipids.
4. Waxes.
5. Phospholipids: phosphatidyl compounds - sphingomylines. Importance and functions.
6. Glycolipids.
7. Sterols: ergosterol and cholesterol, 7-dehydrocholesterol, vitamin D, bile acids and steroid hormones.
8. Eicosanoids: prostanoids, prostaglandins, prostacyclins, thromboxanes, leukotrienes and lipoxins.
9. Polyprenoids: share the same parent cholesterol, ubiquinone and dolichol
10. Isopernoids : fat soluble vitamins and carotenes
11. Lipid peroxidation and antioxidants

4-AMINO ACIDS AND PROTEIN:

1. Amino acids: classification according to different parameters: Essentiality, polarity, nutritionally, and structural.
2. Properties: optical activity, amphoteric and general properties, peptide formation (examples — glutathione- insulin etc) - derived compounds.
3. Biochemical importance and functions of proteins: structural — defense — enzymes — transport — regulation — some hormones.
4. Conformation of the proteins: primary, secondary, tertiary, quaternaly — domains — motifs denaturation.
5. Classification: simple — conjugated.
6. Hemoproteins: myoglobin and hemoglobin, structural function — hemoglobin, derivatives — types of Hb - cytochromes — catalase.
7. Immunoglobulin: structure and function of the different type of immunoglobulins.
8. Methods of proteins separation

5-ENZYMES:

1. Nature of enzymes: protein mainly - ribozymes.
2. Mechanism of actions
3. Specificity.
4. Classification.
5. Coenzyxnes and activators
6. Isoenzymes and zymogens.
7. Enzyme units— activity — specific activity - factors affecting enzyme activity.
8. Enzyme kinetics Michaclis constant km and its significance, V max ,Lineweaver -Burk plot (double reciprocal plot) and determinations of km and Vm.
9. Inhibitors: different types and their effect on km and Vm
10. Regulation of enzyme activity.
11. Application and significance of enzyme assay in medicine.

6-VITAMINS:

1. Introduction and Classifications
2. Water soluble vitamins and the derived coenzymes — biochemical changes due to deficiency.
3. Fat soluble vitamins and their role in biochemical activities

4- Teaching and Learning Methods

4.1- Formal Lectures
4.2- Practical classes
4.3- Tutorial classes

5- Student Assessment Methods

5.1 Written examination to assess knowledge and understanding
5.2 Oral examination to assess knowledge and understanding
5.3 Practical examination to assess practical skills

Books

6.1-Course Notes

Lectures notes in medical biochemistry for first year medical students by staff members of Department of Medical Biochemistry, Faculty of Medicine, Tanta University, Tanta University Press, 2005

6.2- Essential Books (Text Books)

1 **Lippincott's Reviews of Biochemistry,** 3rd edition by Champe PC, Harvey RA, Ferrier DR, Lippincott William & Wilkins London, 2005

2 **Text book of Biochemistry with Clinical Correlations** 5th Ed, Devlin TM Ed.Wiley -Liss New York 2002
3 **Harper's Illustrated Biochemistry:** 26th Ed by Murray RK, Granner DK, Mayes PA, Rodwell VW, McGraw-Hill companies New York, 2003.

Course specification of Microbiology I

Level: 3rd year/first semester
Credit hours 3

1-Aims of this course

The course is designed to provide the students with knowledge about the microbial cell structure ,the major groups of microorganisms, normal flora pathogen city, immunology, autoimmunity and clinical microbiology , Which have been studied by students previously in pharmaceutical biochemistry.

2-Teaching Methods:

Lectures, tutorials and seminars

3-Learning Outcomes:

At the end of this module , student will be able to:

5. Understand the antigenic structure of all microorganisms
6. Understand the classification of microorganisms
7. Deal with infections. Pathogenecity and normal microbial flora.
8. Know the immune system and its disorders.

4- Course contents

lecture	subject
(1)	Fundamentals of microbiology. Cell structure.
(2)	The major groups of bacteria. Microbial metabolism
(3)	Microbial genetics Pathogenecity and infection
(7)	Normal bacterial flora. Respiratory tract infection UTI (urinary tract infection).
(8)	Diarrheal diseases Meningitis Sepsis (Infection of skin, wounds, burns and eyes).
(9)	Systemic bacteriology
(10)	Systemic bacteriology
(11)	Virology
(12)	Virology
(13)	Mycology
(14)	Mycology

Modes of Assessment:

Modes of Assessment	Score	Date
First Exam	20	6th week
Second Exam	20	12th week
Assignment/Seminar/Project/	10	4th , 5th , 10th and 11th
Final Exam (Comprehensive)	50	16th week

Text Books and Supporting Materials:

Text book:

Pharmaceutical Microbiology by Anthony Cundell.

References:

1-Pharmaceutical Microbiology by A.D. Russell, W.B Hugo (editor) publisher: Blackwell Science 3rd edition (December 1983) USBN: 0632010487

2-Medical Microbiology by Patrick Murray, Ken Rosenthal, G. Kobayashi, M, pfaller. Publisher: Mosby 4th edition (January 15 ,2002) ISBN: 0323012132

3-Clinical Microbiology Made Ridiculously Simple


THIRD YEAR/
SECOND SEMESTER

Course specification of Pharmaceutical microbiology II

Level : 3rd year/second semester
Credit hours 3

Aims of this course

At this level the student has been known how to prevent pharmaceutical product from microbial contamination during the knowledge of the sterilization and disinfection, antimicrobial agents including types, uses, properties, mode of action in addition to the bacterial resistance.

Also the source coves pharmaceutical products, contamination, preserving, quality control, and production of therapeutically useful substances by recombinant DNA technologies, which have been studied by student's previously pharmaceutical microbiology (I

Learning Outcomes:

At the end of this module , student will be able to:

1-Undestand the principles of sterilization and disinfection.
2-Have knowledge of all types of antimicrobial agents and their mechanisms of action.
3-To deal with bacterial resistance against antimicrobial agents.
4-Have knowledge of classification of non antibiotic antimicrobial agents and their mechanisms of action.
5-To deal with microbiological aspects of pharmaceutical industry.
6-Have knowledge of factory and hospital hygiene and good manufacturing practice.

Course contents:

Week	Subject
(1)	An Introduction to the pharmaceutical Microbiology
(2)	An Introduction to the pharmaceutical Microbiology
(3)	Sterilization and principles and practice of disinfection
(4)	Sterilization and principles and practice of disinfection
(5)	Anti-microbial agents Types of antibiotics, synthetic, anti-microbial agents and semi synthetic.
(6)	Clinical uses of anti- microbial drugs Manufacture of antibiotics.
(7)	Methods of assaying antibiotics
(8)	Bacterial resistance to antibiotics and (MIC) Chemical disinfectants, antiseptic and preservatives
(9)	Evolution of non- antibiotic anti-Microbial agents Mode of action of non-antibiotic antibacterial agents
(10)	Resistance to non-antibiotic anti-microbial agent
(11)	Microbiological aspects of pharmaceutical processing
(12)	Ecology of microorganisms as it affects the pharmaceutical
(13)	Microbial spoilage and preservation of pharmaceutical products
(14)	Contamination of non-sterile pharmaceutical in hospital and community environments (nosocomial infection)
(15)	Factory and hospital hygiene and good manufacturing practice

Modes of Assessment:

Modes of Assessment	Score	Date
First Exam	20	6th week
Second Exam	20	12th week
Assignment/Seminar/Project/ Quizzes/tutorial	10	4th , 5th , 10th and 11th
Final Exam (Comprehensive)	50	16th week

Text Books and Supporting Materials:

Text book:

Pharmaceutical Microbiology by Anthony Cundell. Publisher: Interpharm

References:

1-Pharmaceutical Microbiology by A.D. Russell, W.B Hugo (editor) publisher: Blackwell Science 3rd edition (December 1983)

2-Medical Microbiology by Patrick Murray, Ken Rosenthal, G. Kobayashi, M, pfaller. Publisher: Mosby 4th edition (January 15 ,2002)

3-Clinical Microbiology Made Ridiculously Simple

4-Medical Microbiology & Immunology: Examination & Board Review by Warren , Md, phd Levinson, Ernest, Md, phd Jawetz. Publisher: Appleton & Lange; 7th edition (July 12, 2002) ISBN :0071382178

Course specification of Biochemistry 2

Course Specifications
Department offering the program: Medical Biochemistry Department
Department offering the course: Medical Biochemistry Department
Academic year / Level *third year/ second semester*

A- Basic Information

Title: Metabolic Biochemistry
Credit Hours: 3hr lecture: 2
Practical: 1

B- Professional Information

2 To give the students insight into appreciating how understanding of metabolic processes occurring in the human body, could contribute to the
3 To make students familiar with the various control and integrating mechanisms of diverse biochemical events in different metabolic processes, and to understand normal and abnormal human metabolism.
4 Knowledge of basic chemical constituents of biological fluids in health and disease, with the ability to determine the relevant investigations for their applications in clinical diagnosis.
5 To enable the student to illustrate and/or describe the metabolic pathways of purines and pyrimidines bases.
6 To enable the student to point out the bioenergetics of the concerned metabolic pathways under different physiological circumstances.
7 To give students experience in biochemical methodology in order to be aware with the clinical biochemistry techniques as diagnostic tools and to be

a- Knowledge and Understanding:

al- Define the metabolic pathways of carbohydrates, lipids, proteins, nucleotides and their micro-molecules and determine the site of each.
a2- Illustrate the steps and regulatory mechanisms of these pathways.
a3- Point out the related metabolic disorders and their clinical prints on biochemical and molecular basis.
a4- Point out the functions of hormones and minerals, their biochemical, clinical and laboratory importance and deficiency manifestations of each.
a5- Describe the components of some body fluids; viz. blood, urine, milk, Semen, CSF and sweat.
a6- Understand the differing mechanism which the body uses to get rid various types of foreign chemical as drugs , food , additive , and pollutants.
a7- Understanding the role of antioxidants in prevention and treatment of chronic diseases.

b- Intellectual Skills

bl- Interpret symptoms, signs and biochemical laboratory findings of some metabolic disorders.
b2- Interpret urine report outcome
b3- Point out the clinical significance of determination of plasma levels of glucose, total proteins, albumin, cholesterol, creatinine and uric acid
b4- Diagnose the type of abnormality of pathological glucose tolerance curve.

b5- Point-out the etiology of metabolic disturbance in a given case study report.

c- Professional and Practical Skills

cl- Identify the physical and chemical characters of normal urine under different physiological conditions.

c2- Perform chemical tests to detect abnormal constituents of urine.

c3- Estimate serum levels of glucose, total proteins, albumin, cholesterol, creatinine and uric acid by colorimetric methods.

c4- Assess glucose tolerance by glucose tolerance test.

d- General and Transferable Skills

dl- The student is able to work effectively in a group in lab or during preparation of seminars.

d2- The student respects the role of staff and co-staff members regardless of degree or occupation.

Course contents

1-Carbohydrate metabolism

glycogen metabolism, gluconeogenesis, special metabolism of fructose, galactose and aminosugars, pathological aspects of carbohydrate metabolism and their clinical implications with special emphasis on diabetes mellitus and biochemistry of insulin and other disorders of carbohydrate metabolism and their clinical importance.

2. Metabolism of lipids:

Dietary lipids, digestion and absorption, metabolism of triacylglycerol, fatty acid metabolism, metabolism of: eicosanoids, conjugated lipids, cholesterol, ketone bodies, classification and disorders of plasma lipoproteins. Pathological aspects of lipid metabolism and their clinical implications.

3. Metabolism of proteins:

Dietary proteins, digestion and absorption, general aspect of protein metabolism, metabolism of ammonia, metabolism of individual amino acids with related errors of metabolism, pathological aspects of protein and amino acid metabolism and their clinical implications.

4. Metabolism of Heme:

Synthesis of porphyrins and heme, catabolism, hyperbilirubinemia and porphyries

5. Bioenergetics steps, regulation, and importance.

6. Metabolism of purines and pyrimidines:

Digestion and absorption of nucleic acids, biosynthesis and catabolism of purines and pyrimidines with the related errors of metabolism (including gout), and synthetic base analogues and their clinical use.

7. Integrative aspect of metabolism:

Interconversion of major food stuffs. Metabolic interrelationship between adipose tissue, the liver and extrahepatic tissues. Starve fed state: early fasting— fasting — fed. Glucose hemostasis. Metabolic interrelationship of tissues in various hormonal states obesity, exercise .Pregnancy and lactation.

8. Mineral:

Major elements (Ca-P-Mg-Na-K-CI-S) and trace elements (Fe, Cu, Zn, Mn, Co., Cr., I.)

9. Body Fluids:

Composition of milk, blood, CSF, sweat seminal fluid and urine in health and disease. Blood plasma, clinical importance of plasma enzymes and proteins .Biochemical aspects of coagulation.

10. Biochemistry of endocrine glands:

Group I hormones that bind to intracellular receptor. Group II hormones that hind to cell surface receptor. Mode of action. Secondary messenger. Hormones that regulate calcium: Parathyroid hormones, calcitonin and calciteriol. Endocrine functions of pancreas: Insulin, glucagon, somatostatin and pancreatic polypeptide: Structure, function an their pathological disorders. Hormones of hypothalamus, pituitary, thyroid adrenal and gonads: Structure, function and their pathological disorders.

11. Tissue chemistry and immunochemistry:

Biochemistry of connective tissue, bone connective tissue, skeletal and cardiac muscles and cytoskeleton, biochemistry of immune responses.

12. Free radicals and antioxidants:

Sources of free radicals. Effect of free radicals on tissues. Antioxidants: types and their roles in prevention and treatment of chronic diseases and cancer

13-Proteins, Aminoacids, disorders related with structures and metabolism

14- Liver and Kidney function and disorders

4- Teaching and Learning Methods

4.1- Formal Lectures

4.2- Practical classes

4.3- Tutorial classes

5- Student Assessment Methods

5.1 Written examination to assess knowledge and understanding

5.2 Oral examination to assess knowledge and understanding

5.3 Practical examination to assess practical skills

Assessment Schedule

Assessment 1 ..... Week

Assessment 2 ..... week

Assessment 3 ..... Week

Assessment 4 ..... Week

Books

6.1-Course Notes

Lectures notes in medical biochemistry for first year medical students by staff members of Department of Medical Biochemistry, Faculty of Medicine, Tanta University, Tanta University Press, 2005

6.2- Essential Books (Text Books)

1. **Lippincott's Reviews of Biochemistry,** 3rd edition by Champe PC, Harvey RA, Ferrier DR, Lippincott William & Wilkins London, 2005
2. **Text book of Biochemistry with Clinical Correlations** 5th Ed, Devlin TM Ed.Wiley -Liss New York 2002
3. **Harper's Illustrated Biochemistry:** 26th Ed by Murray RK, Granner DK, Mayes PA, Rodwell VW, McGraw-Hill companies New York, 2003.

6.3- Periodicals, Web Sites,... etc

- http://www.kumc.edu/biochemistry/resource.html
- http://www.medlib.iupui.edu/ref/biochem.htm

Course specification of Pharmacognosy II

Course specifications
Programme(s) on which the course is given: Bachelor Degree in Pharmaceutical Sciences
Department offering the course: Pharmacognosy
Academic year / Level: third year /second semester

A- Basic Information

Title: PharmacognosyII
Credit Hours: 4/week
Lecture: 2/week
Practical: 2/week
Total: 5/week

B- Professional Information

1 – Overall aims of course

Upon successful completion of this course, the students should be able to

1. Illustrate the morphological and histological structures of different organs of
2. Medicinal plants such as seeds, fruits, roots and rhizomes. The students should
3. Be also able to discuss role of these medicinal plants in the treatment of different
4. Disease conditions are also studied.
5. The student in this end of this course will be able to identify many medicinal
6. Plants microscopically in both their entire and powdered forms.

2 – Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:

The student should be able to

1. Describe the histological structure of the different medicinal plant parts viz. herbs and unorganized drugs.
2. Give an account on the biologically active principles in each plant part viz. (herbs and unorganized drugs) as well as their biological activity.
3. Design a regime for optimum nutrition (minerals and vitamins).

b- Intellectual skills

The student should be capable of:
- Determine unknown drugs viz. herbs and unorganized drugs.
(morphologically, microscopically and chemically)
- Judge whatever the powdered drug is related to herbs and identify
unorganized drugs through chemical tests.

c- Professional and practical skills

The student should be capable of:

1. Use the microscope to decide a given unknown plant powder is related to herbs and unorganized drugs.
2. Design and perform experiments for detection of adulteration.
3. Perform some experiments to know the nature of unorganized.

d- General and transferable skills

The student should be able to:

1. Work effectively in team.
2. Demonstrate written and oral communication skills.

3- Contents

1. **Introduction to herbs**
    - Hyoscyamus
    - Lobelia
    - Mentha
    - Ergot
    - Cannabis
    - Thyme
    - Diatoms
    - Focus &laminaria
    - Carrageen
    - Saccharomyces.
    - Penicillium
    - Mushroom.
    - Cetraria
    - Ephedra
    - Sabina
    - Broom tops
2. **Introduction to unorganized drugs**
    - Opium
    - Agar
    - Gelatin
    - Gambier
    - Cutch
    - Aloes
    - Ehinacea
    - Kinos
    - Colophony
    - Rectified oil of
    - turpentine.
    - Guaiacum resin
    - Jhan resin
    - Cannabis resin
    - Mastic
    - Copaiba
    - Canada turpentine
    - Myrrh
    - Asafetida
    - Galbanum
    - Ammoniacum
    - Olibanum
    - Benzoin
    - Balsam Peru

- Balsam Tolu
- Storax
- Gum acacia
- Gum tragacanth
- Karaya gum
- Manna
- Guar gum
- Simbhal
- Tamal
- Evening primrose
- Theobroma oil
- Castor oil
- Linseed oil
- Olive oil
- Almond oil
- Bees wax
- Carnuba wax
- Purified honey
- Royal jelly
- Bee propolis
- Bee pollen
- Bee venom
- Unorganized drugs in

3. Vitamins and minerals

4– Teaching and learning methods

4.1- Lectures (Tools: board, overhead projector, data show). The lectures were added on the internet site of the faculty to be available to the students all the time as an *e*-learning.

4.2- Practical Session (Tools: labs., boards, instruments, chemicals, glassware, equipments).

4.3- Assignments, seminars, researches and posters.

5- Student assessment methods

5.1- Written exam(s) **to assess** knowledge and understanding and intellectual skills.

5.2- Practical exam(s) **to assess** practical skills.

5.3- Periodic exam(s) **to assess** understanding and intellectual skills.

5.4- Oral exam **to assess** knowledge and understanding and intellectual skills.

Weighting of assessments

Periodic Examination	10%
Final-Term Written Examination	50%
Practical Examination	20 %
Oral Examination.	20%
Total	100%

6- List of references

6.1- Course notes

Lecture and practical notes prepared by instructors

6.2- Essential books (text books)

……..

6.3- Recommended books

1. Trease, G.E.& Evans, W.C.; "Pharmacognosy", W.B. Saunders Publishers, Ltd, 15th ed., 2002.

6.4- Periodicals, Web sites, … etc

http://www.pubmed.com
http://www.botanical .com
http://www.herbmed.com

7- Facilities required for teaching and learning

Study halls, Laboratories, equipment, chemicals, glasswares, books, audiovisual tools

Course specification of Organic chemistry IV

Credit hours: 3
Prerequisite :organic chemistry (III)

Aims (Module Purpose):

After completion of pharmaceutical organic chemistry (III) and it's fundamentals, in particular the organic functional groups, this course will provide a comprehensive and sound understanding of the aromatic compounds and their preparations, reactions and IUPAC nomenclature, in this course the student will study the nitrogen compounds, arylhalid,. Phenol and sulphonic acid and their derivatives.

student will know the organic functional groups and thee preparation and reactions.

Teaching Methods

Lectures and seminars.

Learning Outcomes:

At the end of this module, student will be able to:
1-Be able to nomenclate the different organic compounds.
2-Have a Knowledge of basic organic chemistry regarding synthesis and eactions of the main organic functional groups, organic stereochemistry.
3-Have a good understanding of organic sugar types.

Module outline:

Week	*Subject*
(1)	Polynuclear Aromatic Compounds : Definition, Bonding in Polynuclear Aromatic Compounds (Naphthalene, Anthracene, Phenanthrene), Naphthalene, Nomenclature and Isomerism of Naphthalene Derivatives, Physical Properties of Naphthalene, Chemical Properties of Naphthalene (Substitution reactions, Halogenation, Nitration, Sulphonation, Friedel-Craft's Reactions, The Mechanism of Substitution in Naphthalene, Addition Reactions, Reduction, Addition of Halogens, Oxidation, Orientation of Substitution in Naphthalene and Its Derivatives, Effect of Activating and Deactivating Groups), Anthracene, Phenanthrene
(2)	Heterocyclic Compounds: Definition, Nomenclature of Monocyclic Rings Containing One or More Heteroatoms (Pyrrole, Furan, Thiophen, Imidazole, Oxazole, Thiazole, Pyrazole, Pyrrroline, Pyrrolidine, Pyridine, Pyrimidine and Purine), Nomenclature of Bicyclic Rings Containing One or More Heteroatoms (Purine, Quinoline, Isoquinoline, Carbazole), Aromaticity of Heterocyclic Compounds, Five-membered Heterocyclic Compounds (with One or Two Heteroatoms), Electrophilic Substitution of Five-membered Rings, Six-membered Heterocyclic Compounds with One Oxygen as a Heteroatom (-Pyran, - Pyran, - Pyrone, - Pyrone and Their Derivatives), Six-membered Heterocyclic Compounds with One Nitrogen as a Heteroatom (Pyridine, Quinoline, Acridine and Their Derivatives), Reactions of Six-membered Heterocyclic Compounds, Six-memebered Heterocyclic Compounds with Two Heteroatoms (Pyridazine, Pyrimidine,

	Pyrazine and Their Derivatives), Condensed Systems Consisting of Pyrazine Ring
(3)	Elemental Analysis Elemental Analysis and Calculations (Qualitative Elemental Analysis, Quantitative Elemental Analysis, Determination of the Molecular Weight) by the Vapour Density Method, by the Cryoscopic Method, by the Rast Method, by the Neutralisation Equivalent, and by the Vapour Pressure Osmometry Method), Molecular Formulas, The Index of Hydrogen Deficiency. Electronic absorption Spectroscopy (UV/VIS):Definition, Electronic Energy Changes, Principles of Absorption Spectroscopy, The Relationship of max and max to Structure, Solvents, Chrmophores, The Effect of Conjugation, The Woodward-Fieser Rules for Dienes, Carbonyl Compounds, Solvent Shifts (a more detailed examination), Aromatic Compounds, Substituents with Unshared Electrons, Substituents Capable of -Conjugation, Electron Releasing and Electron Withdrawing Effects, Disubstituted Benzene Derivatives, Polynuclear Aromatic Hydrocarbons and Heterocyclic Compounds, Model Compound Studies Visible Spectra, Colour in Compounds. Infrared Spectroscopy : 4 Hrs Introduction, The Infrared Absorption Process, Uses of the IR Specrum, The Modes of Vibration and Bending (Symmetric and Asymmetric Stretching Vibrations, and In-plane and Out of Plane Bending Vibrations), Bond Properties and Absorption Trends, Examining IR Spectra, Correlatio Charts and Tables, Analysis of IR Spectrum. Nuclear Magnetic Resonance (NMR) Spectroscopy : 5 and 1/2 Hr Introduction, Nuclear Spin States, Nuclear Magnetic Moments, Absorption of Ener Mechanism of Absorption (Resonance) The Chemical Shift and Shielding, The NM Spectrometer, Chemical Equivalence, Integrals, Chemical Environmental and Che Local Diamagnetic Shielding (Electronegativity Effects, Hybridisation Effects, Ac Exchangeable Protons, Hydrogen Bonding), Magnetic Anisotropy, Spin-Spin Splitting (N+1) Rule, The Origin of Spin-Spin Splitting, Pascal's Triangle, The Coupling Constant. Mass Spectroscopy (MS) : 3 and 1/2 Hrs The Mass Spectrometer, The Mass Spectrum, Molecular Weight Determination, Molecular Formulas from Isotope Ratio Data, Some Fragmentation Patterns, Additional Topics.

Course specification of Pharmaceutics IV

Course Specifications

Department offering the programme: - pharmacy

Department offering the course: - Pharmaceutics

Academic year / Level: four/ second semester

A- Basic Information

Title: Pharmaceutical biotechnology Code:
Credit Hours: 2hr Lecture:2

B- Professional Information

1 – Overall Aims of Course

Pharmaceutical biotechnology is a rapidly developing area. This course aims

1. To provide students with an in-depth understanding in this emergent area
2. To provide them with a comprehensive analysis of the drug discovery process - from concept to production to quality control.
3. It will cover: pathogen identification, drug discovery, i.e. target identification, pharmacological assay development, and understanding microbial agents responsible for morbidity and mortality within the human and other economically important populations.
4. Additionally it will also cover the production protein based biopharmaceuticals, including: vaccines, therapeutic antibodies, diagnostic antibodies and other recombinant protein therapeutics such as recombinant insulin.–

Intended Learning Outcomes of Course (ILOs)

a-Knowledge and Understanding:

a1. Demonstrate an in-depth understanding of a range of current industrial and research topics in biotechnology.

a2. Have an awareness of the control needed in bulk biological and biotechnological production in the pharmaceutical industry.

a3. Abstract and interpret key information from technical procedures, research reports and published works.

a4. Demonstrate a systematic understanding of the state of the art within a relevant area of biopharmaceutics.

a5. Demonstrate a comprehensive understanding of some techniques applicable to research in Pharmaceutical Biotechnology.

a6. Demonstrate originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline.

c- Professional and Practical Skills

c1- Ability to design the pharmaceutical biotechnology products.

d- General and Transferable Skills

d1. Work separately or in a team to research and prepare a scientific topic.

d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.

3- Contents

Topic	**No. of hours**	**Lecture**
• Basic principles of biotechnology • An introduction to the development of protein and peptide drugs, vaccines, and other drugs produced by biotechnological techniques involving molecular biology and/or genetic manipulations.	6	3
• Application in disease management and the pharmaceutical industry	2	1
• Topics include basic principles, descriptions of objectives and methodology, and examples of modern drugs produced by these techniques. • Therapeutic effects and clinical applications of currently marketed products are addresses	4	2
• Properties, clinical uses, reported adverse effects of commercial recombinant biopharmaceuticals. • Comparison of recombinant and natural biological products.	4	2
• Design and operative mechanism of diagnostic aids and their use in the detection of blood glucose, cholesterol/triglyceride levels, pregnancy/ovulation and HIV infection. • Therapeutic applications of these products including aspects of molecular biology, pathology, pharmacotherapy, and pharmacoeconomics.	6	3
• A partial list of the disease states covered will include cystic fibrosis, transplantation, AIDS, renal failure, and cancer.	4	2
Total hours	28	14

4– Teaching and Learning Methods

4.1- Lectures

4.2- Tutorials

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Mid term exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding

Assessment Schedule

Assessment 1 mid term exam	Week 6
Assessment 2 practical	week 12
Assessment 3 final exam	Week 14

Weighting of Assessments

Mid-Term Examination	30	%
Final-term Examination	70	%
Total	100	%

6- List of References

6.1- Course Notes

6.2- Essential Books (Text Books)

1. Pharmaceutical Biotechnology: Vyas and Dixit.
2. Gene VII: Lewin Benzamin.
3. Industrial Microbiology: L.E. Casida.
4. Biotechnology- The Biologica

Course specification of Pharmacology I

Course Specifications
Department offering the programme:- pharmacology
Department offering the course:- Pharmacology.
Academic year / Level: third year -second semester.

A- Basic Information

Title: Pharmacology I **Code:**
Credit Hours: 3hrs **Lecture: 2 Practical: 1hr Total:**

B- Professional Information

1 – Overall Aims of Course

1. Giving a knowledge about the pharmacokinetic of drugs (absorption, distribution, metabolism and excretion).
2. Pharmacodynamic of drugs (mechanism of drug action & their biological effects on different body organs and drug-protein binding) and dosage form of drugs (advantages & disadvantages).
3. Uses &Adverse drug reactions & their side effects (drug toxicity, abuse, and their misuse).
4. Giving the types of drug-drug interactions.

2 – Intended Learning Outcomes of Course (ILOs)

a- Knowledge and Understanding:

a1- Define the drugs affecting G.I.T & R.S.
a2- Identify action and indication of the drugs.
a3- Recognize the side effects of various drugs .
a4- Explain Mechanism of these drugs.
a5- Explain the reasons for various indication of the drugs.
a6- Identify various drugs used in hospitals, polyclinic and pharmacy sections**.**

b- Intellectual Skills

b1- Read the dive prescribed drugs.
b2- list precaution to be taken for each drug.
b3 -Explain how to deal with patient when side effect occurred.

c- Professional and Practical Skills

c1-Differentiate between the side effect and adverse effect.
c2- Identify the abbreviations used in pharmacology**.**

d- General and Transferable Skills

d1-Apply principles of human needs.
d2- Great a management plan for drugs administration**..**
d3- Evaluate a management plan for drugs administration**..**

3- Contents

	No. of hours	Lect.	Pract.
General pharmacology • General pharmacology Definitions. • Drug source & classification. • Pharmacokinetic:-Absorption, Distribution, bio transformation & Excretion. • Routes of drugs administration • Pharmacodynamics: –Theory of receptors, -drug-protein binding • Adverse drug effects. • Drug-drug interaction.			
Autonomic Nervous System: -General Physiological principles. -Sympathomimetics: I- Adrenaline, Noradrenaline, ephedrine, Isoprenaline, Dopamine, Dobutamine, amphétamine& methyl amphetamine. II- Sympathomimetics for specific systems 1- Vasopressor sympathomimetics e.g.: mephenteramine, methoxamine, phenylephrine 2- Vasodilator and uterine relaxants sympathomimetics e.g. isoxsuprine & Ritodine 3- Nasal decongestants e.g. Naphazoline, Xylonetazoline, tetrahydrazoline. 4- Antiasthmatic sympathomimetics e .g: Salbutamol& terbutaline. -Sympathetic Depressants: **I- Adrenergic Receptor Blockers**			
A) α-blockers: 1- Ergot alkaloids e.g: ergotamine & ergometrine. 2- Imidazoline derivatives e.g. tolazoline & phentolamine 3-Beta-haloalkyl amines e.g phenoxybenzamine & dibenamine. 4-Other cx- blockers e.g: prazosin, yohimbine - Treatment of migraine & phaeochromocytoma.			
B-)β- Blockers: 1- Selective f3 Blocker e.g: Acebutolol, etc.... 2-Selective 1 blocker e.g: Atenolol, Butoxamine, etc... 3- Non selective i3 32 blocker e.g: propranolol, etc			

C-) α and βblockers: e.g: labetalol. II -Antiadrenergic drugs: e.g. guanethidine, bretylium, reserpine & a methyldopa. III- a_2-receptor agonist: a_2 receptor stimulants e.g.: Clonidine. **-Parasympathomimetics:** I- Choline esters e.g.: acetyicholine, methacholine, carbachol, Bethanecol. II- Natural cholinomimetic alkaloids e.g.: pilocarpine. III- anticholinesterase drugs e.g.: physostigmine, Neostigmine, Neostigmine substitutes pyridostigmine, edrophonium) & Organophosphorus compounds.			
-Treatment of Mysthenia gravis. **-Parasympathetic depressants:** I- Natural products e.g.: Atropine & hyoscine. II- Synthetic atropine substitutes: 1- Mydriatics & cycloplegics e.g: Homatropine, etc. 2- Antispasmodics e.g: pirenzepine, etc... 3- Antiparkinsonism e.g: Benzotropine, etc... -Ganglion stimulants & blockers (Nicotine ،D.M.P.P, hexamethoni urn, etc…)			
Drugs affecting GIT • Antiulcer and antacid drugs • Emetics and antiemetic drugs • Liver disease and gallstones • Constipation & laxatives • Diarrhea & anti-diarrheal agents • Amoebiasis & Giardiasis • Inflammatory bowel disease (IBD). • Anorexigenic agents • Appetizers. • Digestants. • Carminatives			

4– Teaching and Learning Methods

4.1- Lectures, Discussion.
4.2- Group discussion.
4.3- practical

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Mid term exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding
5.4- Practical exam	to assess the practical skills.

Assessment Schedule

Assessment 1 mid term exam	Week 6
Assessment 2 practical	week 12
Assessment 3 final exam	Week 14

Weighting of Assessments

Mid-Term Examination	20	%
Final-term Examination	60	%
Practical Examination	20	%
Total	100	%

6- List of References

6.1- Course Notes

6.2- Essential Books (Text Books)

1- Rang, Dale and Ritter Pharmacology (2000)
2-Katzung –Basic and Clinical Pharmacology (2001)
3-Tripathi –Essential Pharmacology (2001)
4-Laurence, Bennett and Brown-Clinical pharmacology (1997)
5-Goodman & Gilman's- The pharmacological basic of therapeutics (1995)
6-British National Formulary (BNF) (2002)
7-The Washington manual of medical therapeutics (2000).
8- Grahame-Smith and Aronson –Oxford Textbook of Clinical Pharmacology and Drug therapy (1987).
9-Medical Pharmacology at a Galance (1998).

6.3- Recommended Books

6.4- Periodicals, Web Sites … etc


FOURTH YEAR/
FIRST SEMESTER

Course specification of Biopharmaceutics &Pharmacokinetics I

Department offering the programme: - pharmacy
Department offering the course: - Pharmaceutics
Academic year / Level Fourth year/First semester

A- Basic Information

Title: Basic biopharmaceutics and pharmacokinetics Code:
Credit Hours: 3hr Lecture: 2
Tutorial: Practical:1 Total:

B- Professional Information

1 – Overall Aims of Course

To provide a conceptual and quantitative background in pharmacokinetic theory and applications needed to pursue advanced studies in clinical pharmacokinetics and biopharmaceutics as applied to drug delivery system design and pharmacokinetic theory.

2 – Intended Learning Outcomes of Course (ILOs)

a-Knowledge and Understanding:

a1. Understanding the effects of various physicochemical, biochemical, physiological and pathological processes on the kinetics and extent of drug absorption, distribution, and elimination.

a2. Explain the effects of dosage form design and routes of drug administration on therapeutic drug levels optimization.

a3-Differentiate between passive diffusion, facilitated diffusion, and active transport.

a5-Characterize the impact of efflux proteins at various anatomical sites (i.e., intestinal, placental, and blood-brain barrier) on the concentration and pharmacologic effect achieved.

a6-Describe the significance and impact of the first-pass effect after oral administration.

a7-Describe how formulation characteristics influence the disposition and action drugs after various routes of administration (especially via the pulmonary and ophthalmic routes).

b- Intellectual Skills

b1- Design of bioavailability and bioequivalence studies**.**

b3- Ability to use empirical pharmacokinetic models to devise and optimize dosage regimens.

c-Professional and Practical Skills

c1- Ability to adjust and optimize the dose and dosage regimen.

c2- Estimation of drug half life

d-General and Transferable Skills

d1. Work separately or in a team to research and prepare a scientific topic.

d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.

3- Contents

Topic	No. of hours	Lecture	Tutorial/ Practical
• **Introduction to Biopharmaceutics** • **Effect of various routes of administration on drug bioavailability** • **GIT absorption of drugs** o Mechanism of drug absorption o Physiological factors affecting oral absorption o Physical-Chemical factors affecting oral absorption o Formulation factors affecting oral absorption o Techniques for the GIT absorption assessment	12	6	
• **Biopharmaceutics study of drugs** o Distribution o Metabolism o Elimination	12	6	
• **Bioavailability and bioequivalence** o Definition o Method of determination of bioavailability using blood and urine excretion data. o Protocol design of bioavailability assessment. o Methods of bioequivalence determination	4	2	
Total hours	28	14	

4– Teaching and Learning Methods

4.1- lectures
4.2- tutorials

5- Student Assessment Methods

5.1- Participation& semester work to assess intellectual skills
5.2- Midterm exam to assess the knowledge & understanding
5.3-Final term exam to assess the knowledge & understanding

Assessment Schedule

Assessment 1 midterm exam Week 6
Assessment 2 practical week 12
Assessment 3 final exam Week 14

Weighting of Assessments

Mid-Term Examination and semester work	20	%
Final-term Examination	60	%
Practical	20	%
Total	**100**	**%**

6.2- Essential Books (Text Books)

1 Handbook of Basic Pharmacokinetics-Ritschel, W.A.,Drug Intelligence Publication,
2 Fundamentals of Clinical Pharmacokinetics-Wagner,J.C.,Drug Intelligence Publication,
3 Remington's Pharmaceutical Sciences - Gennaro A.R., ed., 19th Edition, Mack Publishing Co., Easton, PA. 1995. Clinical Pharmacokinetics - Rowland, M. & Tozer,N., 2nd,edi

Course specification of Medicinal chemistry I

Course Specifications
Department offering the programme: -Medicinal chemistry
Department offering the course: - Medicinal chemistry
Academic year / Level third year /first semester
Date of specification approval

A- Basic Information

Title: Medicinal Chemistry I Code:
Credit Hours: 3hr Lecture:2
Tutorial: Practical: 1 Total:

1 – OVERALL AIMS OF COURSE

1. To provide the knowledge of chemistry of drugs with special references to their pharmaceutical and medicinal usage.
2. To provide the knowledge about the relationship of chemical structure and therapeutic properties.
3. To correlate medical chemistry facts with manufacture drugs & clinical application

2-INTENDED LEARNING OUTCOMES:

A- KNOWLEDGE & UNDERSTANDING:

a1-Understand the principles of medicinal chemistry.
a2- Describe the basic principles of mechanism action for active groups in pharmaceutics chemistry
a3-Explain the different reaction between active groups in pharmaceutics chemistry special in preparations of drugs
a3-Explain of nomenclature chemically of medical chemistry.

B- INTELLECTUAL SKILLS

b1- Apply preparation (synthesis) of medical compound drugs
b2- Identify the different of medical compound drugs by assay& titration
b3- Determine medically used & roles of important medical compound drugs.

C-PROFESSIONAL AND PRACTICAL SKILLS

c1- Maintain the name of chemical compound &derivatives or chemical modification effects.
c2- Classification of medical compound drugs according to medically used& active group.

d- GENERAL AND TRANSFERABLE SKILLS

d1. Work separately or in a team to research and prepare a scientific topic.
d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.

3- Content

NO	Topic	No .of hour	Lecture	Tutorial-practical
	Introduction			

	Physiochemical properties ❑ Pharmacokinetics ❑ Acid-Base properties ❑ Drug receptor interaction ❑ Force involved, steric effects			
	Metabolism ❑ Site, pathways, factors ❑ Oxidative reactions ❑ Reductive reactions ❑ Hydrolytic reactions ❑ Conjugation reactions			
	Drug design ❑ Introduction ❑ Physical and chemical properties of drugs. ❑ Isosteres and bioisosteres- pharmacophoric groups. ❑ Use of computer in drug design			
The following topics shall cover Nomenclature, classification, synthetic procedures of compounds mentioned under each category, structure activity relationship, mode of action and therapeutic use.				
Adrenergic agents				
• Sympathomimetic agents • Sympatholytic agents				
Cholinergic agents				
❑ Cholinergic agents ❑ Anticholinergic agents ❑ Ganglionic blocking agents ❑ Neuromuscular blocking agents				
CNS depressants				
❑ General anesthetics ❑ Anxiolytics ❑ Muscle relaxants ❑ Antipysychotics ❑ Anticonvulsants				
CNS stimulants				
❑ Analeptics ❑ Methylxanthines ❑ Psychomotor stimulants ❑ Mao-inhibitors ❑ Tricyclic antidepressants ❑ Psychedelics				

4– Teaching and Learning Methods

4.1- Lectures
4.2- Tutorials
4.3- Practical
4.4- visiting to pharmaceutical industry companies.

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Midterm exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding
5.4- Practical exam	to assess the practical skills.

Assessment Schedule

Assessment 1 midterm exam	Week 6
Assessment 2 practical	week 12
Assessment 3 final exam	Week 14

Weighing of Assessments

Mid-Term Examination	20	%
Final-term Examination	60	%
Practical Examination	20	%
Total	100	%

*- List of References

1. Wilso; Gisvold, Doerge, Text book of organic medical pharmaceutical chemistry 7th edition –J . B. Lippincot.
2. Remington's pharmaceutical sciences,

Facilities Required for Teaching and Learning

* White board & Markers.

Course specification of Phytochemistry I

Level: 3rd year/ first semester
Credit hour:3(2+1)
Prerequisite: Pharmacognosy

Aims (Module purpose):

Based on the information acquire from the pre-requisite courses of Pharmacognosy, pharmacology and instrumental analysis, Phytochemistry course discusses the major pharmaceutically important secondary metabolites from natural sources (phenolics, steroids, terpinoids, glycosides and alkaloids) of pharmaceutical interest. It provides the basic phytochemical knowledge about the natural source, classification, extraction, detection, isolation, pharmacological and toxicological effects. The course extends to the chemistry of natural pesticides as well as drugs of marine origin.

Teaching methods:

Lectures and seminars.

Learning outcomes:

By the end of this course, students should be able to:

1. Understand the scope and importance of Phytochemistry in drug discovery and modern medicine.
2. Recognize the chemical structure, medicinal value, natural source, detection, isolation, characterization and medicinal applications of glycosidic phenols, steroids and terpenes and their importance in orthodox medicine.
3. Recognize the medicinally important alkaloids, their chemical structure, natural sources, detection, isolation and characterization and medicinal applications.
4. Use and recommend natural pesticides and their applications for pharmaceutical industry.
5. Understand the importance and recognize the sources of marine drugs, their toxicities and their promising medicinal applications.
6. Identify and understand the nature, source, production, and medicinal uses of naturally occurring antibiotics.

Module outline:

week	subject
1.	Chromatography Basic concept (partition and adsorption chromatography), Separation techniques (elution, frontal, and displacement analysis),
2.	Chromatography Types of chromatographic methods: Paper chromatography, Thin layer chromatography (TLC),
3.	. Chromatography Types of chromatographic methods: Column chromatography (CC),
4.	Chromatography Gas chromatography (GC), performance liquid chromatography (HPLC), Gel chromatography.

5.	Alkaloids Introduction : Definition, history, occurrence, classification, nomenclature, physical and chemical properties, isolation, purification and detection Alkaloids derived from phenylalanine and tyrosine
6.	Alkaloids Phenylalkylamine-alkaloids : (ephedrine, cathinone, capsaicinoide) Isochinolin-alkaloids (papaverine, morphine, codeine, and emetine) Tropolon-alkaloids (colchicine, demecolcine). Amaryllidaceen-alkaloids : (lycorine, galanthamin) Alkaloids derived from typtophan Indol-alkaloids (physostigmine-, carboline-, ergoline-, ajmalicine-, yohin ajmaline-, and strychnine-type)
7.	Alkaloids Chinoline-alkaloids (Cinchona-alkaloids). Alkaloid deived from histidin: (pilocarpine, isopilicarpine, pilosin). Alkaloids derived from asparagic acid: (ricinine, and Nicotiana-alkaloids). Alkaloids derived from lysin Piperidine-alkaloids (Piper-, Lobelia-, and Pomegranate-alkaloids) Alkaloids derived from ornithine
8.	Alkaloids Tropan-alkaloids (atropine, hyoscyamine, scopolamine and cocaine) Chinazoline – alkaloids (tetradoxine). Alkaloids derived from glycine Purin –alkaloids (caffeine, theiphylline, and theobromine) Terpen – alkaloids: (monoterpen-, sesquiterpen-, and diterpen- alkaloids). Steroidal alkaloids: (Veratum alkaloids).
9.	Steroids : - Definition, classification, structures, chemical and physical properties, characterization. - Sterols (Definition, classification, structures, chemical and physical properties, Pharmacological Importance).
10.	Steroids : ▪ Vitamin D (Sources, structure, action, clinical uses) ▪ Bile acids (Structure, action and uses)
11.	Steroids : Steroid hormones (Sexual hormones and corticoids, classification, structure, action and clinical uses
12.	Bitter principles Definition, classification, chief drugs containing bitter principle

Mode of assessment:

Modes of assessment	score	Date
First exam	20	6th week
Second exam		12th week

AssignmentL Seminar L ProjectL QuizzesL tutorial	10	4th ,5th ,10th ,and 11th week
Final Exam (comprehensive; written, verbal, hand-ins…etc)	40	16th week

Text Books and Supporting Materials:

Text book:

1. Pharmacognosy, Phytochemistry, medicinal plants by Jean Brueton (1995), english edition.
2. Harmacognosy and phamacobiotechnology by James E. Robbers, Marilyn k. Speedie and Varro E. Tyler (1996). Williams and Wilkins.

References:

Students will be expected to give the same attention to these references as given to the Module textbook(s)

1. drugs of natural origin, a textbook of pharmacognsy by Gunnar Samuelsson (1992)
2. Trease and Evans Pharmacognosy by WC Evans, 15th edition (2002)
3. The complete German Commission e Monoraphs, Theraputic Guide to herbal medicines, by Warner
4. Busse, Licia Gldberg, Joerg Gruenwald, Tara Hall, Chance E. Riggins and Robert s. Riste (1999)

Course Specification of Toxicology

Level/year at which this course is offered: Third year/ second semester

A- Basic Information

Title: General toxicology Code:
Credit Hours: 3hr Lecture: 2
Tutorial: Practical: 1 Total:

1- Professional Information

Objectives

1. To understand the basic principles of toxicology and the different disciplines of toxicology.
2. To gain knowledge regarding the supportive measures, therapeutic interventions, specific antidotes as general guidelines of treatment modalities.
3. To understand the mechanism of toxicity, toxicokinetics, clinical presentation, diagnosis and medications indicated and contraindicated in the treatment of toxicity of common drug and chemical groups.
4. To understand the serious consequences of exposure to therapeutic drugs and environmental and occupational chemicals.
5. Gaining knowledge regarding the special considerations with maternal, fetal, and neonatal health.

2- Learning outcomes

a. Knowledge

1. Knowledge about the various means of possible exposure to therapeutic and non therapeutic agents.
2. The students will gain an overview of protocols for managing various toxic ingestions, and the antidotes and treatments associated with their pathology.
3. The students will develop a greater awareness and appreciation for the
4. consequences of ingesting prescription medicines, of exposure of non therapeutic compounds and of the risk from environmental and biological threats to public safety
5. The students will become more knowledgeable to respond to the threat of toxins.

b. Cognitive Skills

1. Understanding the serious consequences of toxic drugs and chemicals exposure and develop knowledge for how to prevent, manage and respond to toxin threats

C. Course Description

The course includes the study of the general principles of toxicology, prevention and management of poisoning, the mechanism(s) of toxicity of the drugs commonly used, the commonly encountered chemicals, radiation and radioactive materials and drugs affecting maternal, foetal and neonatal health. Signs and symptoms of toxicity and managements of the cases are stressed.

3- Topics to be covered

	TOPIC
1.	General Principles of Toxicology: Toxicity, hazard, risk. Branches of toxicology: Occupational, Environmental, Ecotoxicology, Analytical and Clinical.
2.	Types of exposure and toxic responses

	Spectrum of toxicity. Evaluation of safety of chemicals and drugs.
3.	Prevention and Management of Poisoning: Poisoning episodes: Accidental, Suicidal, Homicidal, Nonaccidental Prevention of poisoning:
4.	Management of Poisoning: Maintenance of vital functions Antidotes: non-specific & specific
5.	Prevention of absorption of poisons Enhanced elimination of poisons Supportive management
6.	Poisoning with Common Drugs: Selected OTC Products: Aspirin, Paracetamol, Iron
7.	CNS Depressants: Barbiturates, Benzodiazepines:
8.	CNS Stimulants: Amphetamine & Cocaine
9.	Poisoning with Common Chemicals: Household Toxicants: Solvents, corrosives, gases, cleaning agents (soaps, detergents, bleaches, ammonia solution).
10.	Pesticides: Halogenated & cholinesterase inhibitor insecticides Rodenticides, Herbicides, Fungicides
11.	Common Heavy Metals and Chelators
	Teratogenic and Toxic Effects of Drugs and Chemicals on Reproduction: Possible site of action of teratogens: Effects on father, mother, feto-placental unit and fetus. Principles of teratology as applied to man: Stages of pregnancy, Drug dosage, placental transfer, use of drugs during pregnancy.
12.	Radiation and Radioactive Material Toxicity

4– Teaching and Learning Methods

4.1- lectures

4.2- tutorials

5- Student Assessment Methods

5.1- Participation& semester work to assess intellectual skills

5.2- Midterm exam to assess the knowledge & understanding

5.3-Final term exam to assess the knowledge & understanding

Assessment Schedule

Assessment 1 midterm exam Week 6

Assessment 2 practical week 12

Assessment 3 final exam Week 14

Weighting of Assessments

Mid-Term Examination and semester work	20	%
Final-term Examination	60	%
Practical	20	%
Total	**100**	**%**

Books

Casarett and Doull's Toxicology: The Basic Science of Poisons. C.D. Klaassen, McGraw Hill, New York.

Course specification of Pathology

Academic year: Third /second semester
Credit hours: 2lecture: 2 practical:0

Course Description:

Pathology: The course aims at defining pathology and its various sub-branches as well as its relationship to clinical practice.

General objectives of the course:

1. In Histopathology, medical scientists prepare tissues for light microscope, to detect abnormalities that may indicate cancer or other diseases of tissue.
2. To have good knowledge and understanding of etiology, pathogenesis, pathological changes, effects and possible complication of common disease entities .
3. To recognize the abnormal changes which occur in the involved organs and in the human body as a whole in a certain disease entity .
4. To understand the microscopical changes occurring in the tissues and organs in the studied diseases.
5. To know how to correlate between clinical manifestations of a certain disease and its underlying pathological changes.

Course contents:

• **General pathology:** • **Introduction to pathology**	
Tissue and cell damage and metabolic disturbance ❑ Cell injury and tissue damage ❑ Causes of cell injury and tissue damage ❑ Degenerations: ▫ Cloudy swelling ▫ Types of degeneration ❑ Metabolic disorders, causes and types ❑ Necrosis, causes and types ❑ Inflammation ▫ Definition and etiology ▫ Spread of inflammation ▪ Local inflammation ▪ Metastatic inflammation ▪ Generalized infection ▫ Types of acute inflammations • Local changes: Hyperemia exudation of leucocytes and others cells and phagocytosis • Systemic effects of acute inflammation • Exudative: serous, suppurative, serofibinous & haemorrhagic ▫ Chronic inflammation : ▪ Specific and non-specific ❑ Repair and Healing ▫ Healing wounds	

• Healing by first intention • Healing by second intention • Complication of wound healing ▫ Healing by fibrosis • Mechanism of fibrous tissue formation • Factors influencing wound healing and fibrosis ○ Healing of bone fractures	
❑ ***Neoplasia*** ❑ Types of cellular proliferation ▪ Non-neoplastic - metaplasia - hypertrophy ▪ Hyperplasia - dysplasia ❑ Classification of benign and malignant tumors ❑ Pathology of some benign and malignant tumors ❑ Spread of malignant tumors ❑ Prognosis and grading of malignant tumors ❑ Carcinogenesis & theories of origin of neoplasms ❑ ***Hypertrophy*** ❑ Types of hypertrophy ❑ Diseases associated with hypertrophy ▪ Hypertrophic cardiomyopathy ▪ Congenital hypertrophic pyloric stenosis ❑ ***Hyperplasia*** ❑ Types of hyperplasia ❑ Diseases associated with hyperplasia ▪ Prostatic hyperplasia ▪ Thyroid Hyperplasia ❑ ***Atrophy*** ❑ Types of atrophy ❑ Disorders associated with generalized atrophy ❑ Disorders associated with organ atrophy ▪ Osteoporosis ▪ Alzheimer's Disease ▪ Pick's Disease	
Tumor Pathology ❑ General definition of tumor ❑ Benign tumors ❑ Malignant tumors ❑ Tumors of limited malignancy ❑ Tumor-like lesions **Tumor Classification** ❑ ***Nonepithelial tumors*** ❑ General definitions ▫ Benign nonepithelial tumors ▫ Malignant nonepithelial tumors ❑ Fibrous tumors ▫ Fibroma and fibrosarcoma ❑ Tumors of fatty tissue ▫ Lipoma and liposarcoma	

❑ Cartilage tumors, chondroma ❑ Bone tumors ▫ Osteoma and osteosarcoma ❑ ***Benign epithelial tumors*** ❑ Papillomas ▫ Mucosal papilloma ▫ Urothelial papilloma ❑ Adenomas ▫ Solid adenoma ▫ Tubular adenoma ▫ Fibroadenoma ❑ Adenocarcinoma ▫ Highly differentiated forms ▫ Moderately differentiated forms ▫ Mucigenous carcinomas ❑ ***Carcinomas of specific organs*** ▫ Prostatic carcinomas ▫ Carcinoma of the breast ▫ Lung carcinoma ▫ Colorectal carcinoma	

Methods of teaching:

- Lectures
- Discussion
- Board
- Light microscope,
- Overhead projector
- CDs
- Laboratory and laboratory equipments

References:

Stephen HG, Richared DP***: Principles and Practice of clinical parasitology***, Jhon Wiely & Sons Ltd; New York **2001**.

Ursus-Nikolaus Riede, Martin Werner: ***Color Atlas of Pathology: Pathologic Principles· Associated Diseases***; Thieme Stuttgart· **New York 2004**

Stephen HG, Richared DP***: Principles and Practice of clinical parasitology***, Jhon Wiely & Sons Ltd; New York **2001**.

Course Specifications for first aid

Course Specifications

Department offering the programme: - Pharmacy
Department offering the course:- Community health.

Academic year / Level: fourth year /second semester.
Date of specification approval:

A- Basic Information

Title: first aid Code:

Credit Hours: 2 hrs Lecture: 2hrs

Tutorial: None Practical: None Total: 2 hrs

B- Professional Information

1 – Overall Aims of Course

* This course is designed

1- to provide the student with knowledge, skills and attitudes in the field of environmental health & Nutrition.
2- Also to help the student to acquire knowledge, skills and attitudes in the field of health education and Family planning, enable him/her to participate efficiently in solving some of health problems affecting the community.
3- understand the constituents of the food for the daily requirements of the body in health and illness and their sources, functions and deficiencies.
4- participate effectively in the health education process & Family planning .

2 – Intended Learning Outcomes of Course (ILOs):

a- Knowledge and Understanding:

a1 Identify health problems available in the environment that affect
a2 the community.
a3 Undertake the necessary steps for solving some of health problem affecting the environment and the community.
a4 Understand knowledge in proper Nutrition.
a5 Recognize the constituents of food, their sources, functions, deficiencies and daily requirements in health and illness.

b- Intellectual Skills

b1- Prepare simple Materials for the purpose of health education.

C- Professional and Practical Skills

c1- Accepts Attitude on health team working.

c2- Participate in health education activities in his field.

d- General and Transferable Skills

d1- Advice patients, workers….etc about the proper family planning method

d2- Communicate effectively with clients.

3- Contents

Topic	No.of hrs	Lecture
First aid		
• **Introduction** o Concept of first aid o Objective of first aider o Responsibilities of fist aider		
• **Hemorrhage and cut wounds** o External bleeding o Cuts wound		
• **Shock** o Definition o Types o First aid treatment of shock • **Unconsciousness** o Definition o First aid treatment o Heart massage • **Epileptic fits** o -first aid treatment		
• **Splint and bandage** o Aims of bandaging in first aid o Aim of splinting o Methods of apply bandages		
• **Fractures and dislocation** o A-definition of fractures o Types of fractures o Signs and symptoms o First aid treatment • **B-definition of dislocation** o The first aid treatment		
• **Burns and scalds** o Heat burns o Chemical scalds o first aid treatment		

• **Asphyxia** ○ Artificial respiration ○ P.R		
• **<u>Poisoning</u>** ○ Types ○ Cause ○ Classification ○ Treatment		

4– Teaching and Learning Methods

4.1- Lectures, Discussion.
4.2- Role - Play.

5- Student Assessment Methods

Evaluation of the students will be done by:

5.1 Semester Work. to assess Intellectual ,General and Transferable Skills
5.2 Reports. to assess Intellectual , Professional and Practical Skills.
5.3 MCQs& Examination. to assess Knowledge, Understanding ,Professional Skills.

Assessment Schedule

Assessment 1 Semester Work	Week (4-6)
Assessment 2. Midterm Examination	Week (8)
Assessment 3. Formative exam	Week (12)
Assessment 4. Final Examination.	Week (16)

Weighting of Assessments

Semester Work.	10 %
Midterm Examination	20%
<u>Final Examination</u>	<u>70 %</u>
Total	100%

6- List of References

6.1- Course Notes
Handout .
6.2- Essential Books (Text Books)
Library books
6.3- Recommended Books

1. Community health Nursing (Promoting & protecting the public health) Allender , Judith.
2. Use of guidelines for making pregnancy safer and family planning, W.H.O
3. Evad.Wilson and others (Principles of Nutrition) 4th edition. Wilcy & Sons - New York.
4. Kranse and Mahan (Food, Nutrition and Diet Therapy) 7th edition W.B. Saunders Company - Philadelphia.

5. World Health Organization - A manual on health education in primary health Care - W.H.O. Geneva - 1988.
6. John Gibson, Health Personal and Communal. 4th edition 1976. Faber and Faber - London and Boston.

6.4- Periodicals, Web Sites … etc

7- Facilities Required for Teaching and Learning

* White board & Markers.
* Over head projector.
* Books -handouts.

Course specification of Pharmacology II

Course Specifications

Department offering the programme**:- pharmacology**

Department offering the course**:- Pharmacology.**

Academic year / Level: **fourth year /first semester.**

A- Basic Information

Title: Pharmacology II Code:
Credit Hours: 2 hrs Lecture: 2
Tutorial: Practical:0 Total:

B- Professional Information

1 – Overall Aims of Course

5. Giving a knowledge about the pharmacokinetic of drugs (absorption, distribution, metabolism and excretion).
6. Pharmacodynamic of drugs (mechanism of drug action & their biological effects on different body organs and drug-protein binding) and dosage form of drugs (advantages & disadvantages).
7. Uses &Adverse drug reactions & their side effects (drug toxicity, abuse, and their misuse).
8. Giving the types of drug-drug interactions.

2 – Intended Learning Outcomes of Course (ILOs)

h- Knowledge and Understanding:

a1- Define the drugs affecting cardiovascular and respiratory system
a2- Identify action and indication of the drugs.
a3- Recognize the side effects of various drugs .
a4- Explain Mechanism of these drugs.
a5- Explain the reasons for various indication of the drugs.
a6- Identify various drugs used in hospitals, polyclinic and pharmacy sections**.**

b-Intellectual Skills

b1- Read the dive prescribed drugs.
b2- list precaution to be taken for each drug.
b3 -Explain how to deal with patient when side effect occurred.

i- Professional and Practical Skills

c1-Differentiate between the side effect and adverse effect**..**
c2- Identify the abbreviations used in pharmacology**.**

j- General and Transferable Skills

d1-Apply principles of human needs.
d2- Great a management plan for drugs administration**..**
d3- Evaluate a management plan for drugs administration**..**

3- Contents

Topic		No. of hours	Lecture	Tutorial/ Practical
Cardiovascular System (C.V.S)	• Antihypertensive agents. • Drugs used in treatment of heart failure. • Anti-anginal agents. • Anti-arrhythmic agents. • Drugs for shock • Hypolipidaemic agents	**8**	**4**	2
Respiratory System (R.S)	• Cough therapy • Respiratory stimulants • Drugs used in treatment of Bronchial Asthma. • Drugs used in treatment of Rhinitis.	**6**	**2**	**2**
Autocoids	• Histamine & antihistamines • Serotonin agonists & antagonists. • Eicosanoids, and their uses • PAF, bradykinin	**4**	**2**	**2**

Endocrine System	• Hypothalamic & pituitary gland.
	• Thyroid and antithyroid drugs.
	• Glucagon and adrenocortical steroids
	• Insulin &oral hypoglycemic agents.
	• Sex hormones.
	  ○ Female sex hormones.
	  ○ Male sex hormones.
	• Contraceptives.
	• Pituitary hormones
		6	**3**	3

Urogenital system	• Diuretics • Oxytocics and uterine relaxants	٢	**1**	**1**
Total hours		٢٨	١٤	**10**

4– Teaching and Learning Methods

4.1- Lectures, Discussion.
4.2- Group discussion.
4.3- practical

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Mid term exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding
5.4- Practical exam	to assess the practical skills.

Assessment Schedule

Assessment 1 **Formative assessment**. Week **(2)**
Assessment 2 **Mid-Term Examination** Week **(5)**
Assessment 3 **Formative assessment**. Week **(8)**
Assessment 4 **Final written exam**. Week **(11)**

Weighting of Assessments

Mid-Term Examination	20 %	
Final-term Examination	60 %	
Practical Work		20 %
Total		100%

6- List of References

6.1- Course Notes

6.2- Essential Books (Text Books)

1- Rang, Dale and Ritter Pharmacology (2000)
2-Katzung –Basic and Clinical Pharmacology (2001)
3-Tripathi –Essential Pharmacology (2001)
4-Laurence, Bennett and Brown-Clinical pharmacology (1997)
5-Goodman & Gilman's- The pharmacological basic of therapeutics (1995)
6-British National Formulary (BNF) (2002)


FOURTH YEAR/
SECOND SEMESTER

Course specification of Biopharmaceutics & Pharmacokinetics II

Department offering the programme: - pharmacy
Department offering the course: - Pharmaceutics
Academic year / Level fourth year /second semester

A- Basic Information

Title: Pharmaceutics VI Code:
Credit Hours: 3hr Lecture:3
Tutorial: Practical: Total:

B- Professional Information

1 – Overall Aims of Course

To provide a conceptual and quantitative background in pharmacokinetic theory and applications needed to pursue advanced studies in clinical pharmacokinetics and biopharmaceutics as applied to drug delivery system design and pharmacokinetic theory.

3 – Intended Learning Outcomes of Course (ILOs)

a-Knowledge and Understanding:

a1- Understanding the use of pharmacokinetics to direct the appropriate administration of drugs, particularly intravenous infusion and multiple dose administration.
a2-Understanding the theoretical and practical issues of assessment of drug bioavailability and bioequivalence.
a3-Understanding the difference between bioavailability and bioequivalence.
a4-Ability to estimate pharmacokinetic parameters used in clinical pharmacokinetics and biopharmaceutics using plasma and urine drug level data.
a4- Describe the significance and impact of the first-pass effect after oral administration.
a5-Describe how formulation characteristics influence the disposition and action drugs after various routes of administration (especially via the pulmonary and ophthalmic routes).

b- Intellectual Skills

b1- Design of bioavailability and bioequivalence studies**.**
b3- Ability to use empirical pharmacokinetic models to devise and optimize dosage regimens.

c-Professional and Practical Skills

c1- Ability to adjust and optimize the dose and dosage regimen.
c2- Estimation of drug half life
c3-Ability in the areas of performing pharmaceutical and pharmacokinetic calculations.

d-General and Transferable Skills

d1. Work separately or in a team to research and prepare a scientific topic.

d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.

3- Contents

Topic	No. of hours	Lecture
▪ Terminology and definitions ▪ Rates and orders ▪ Kinetic of drug absorption		
• **Compartment models** o Definition o Basis of Classification o Model selection criteria o **One compartment open model with first order elimination kinetics** ▪ Pharmacokinetics of single dose as oral and intravenous (rapid/bolus). ▪ Intravenous infusion ▪ Multiple oral and intravenous administrations. ▪ Pharmacokinetic of sustained releases formulations o **Two compartment open model with first order elimination kinetics** ▪ Pharmacokinetics of single dose as oral and intravenous (rapid/bolus). ▪ Intravenous infusion ▪ Multiple oral and intravenous administrations. ▪ Pharmacokinetic of sustained releases formulation		
• **Absorption kinetics** o Methods of Estimation of absorption rate constants ▪ Wagner-Nelson ▪ Method of residuals		
▪ Blood level data and urinary data analysis ▪ Drug elimination and clearance: -Renal clearance: -Hepatic elimination of drug		
• **Non-linear pharmacokinetics(dose dependent kinetics)** o Michaels- Menten's kinetics o Pharmacokinetic characteristics. o In-vivo estimation of Km and Vm • Application in bioavailability determination		
Total hours		

4– Teaching and Learning Methods

4.1- lectures
4.2- tutorials

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Midterm exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding

Assessment Schedule

Assessment 1 midterm exam	Week 6
Assessment 3 final exam	Week 14

Weighting of Assessments

Mid-Term Examination and semester work	30	%
Final-term Examination	70	%
Total	100	%

6- List of References

6.1- Course Notes

6.2- Essential Books (Text Books)

1. Handbook of Basic Pharmacokinetics-Ritschel, W.A.,Drug Intelligence Publication, M Hamilton, 1977.
2. Fundamentals of Clinical Pharmacokinetics-Wagner,J.C.,Drug Intelligence Publication, M.Hamilton, 1975.
3. Remington's Pharmaceutical Sciences - Gennaro A.R., ed., 19th Edition, Mack Publishing Co., Easton, PA. 1995. Clinical Pharmacokinetics - Rowland, M. & Tozer,N., 2nd,edition, Lea and Febiger, Philadelphia, 1989.
4. Pharmacokinetics-Gibaldi M. & Perrier, D., 2nd ed., Marcel Dekker, New York, 1982. Pharmacokinetics for the Pharmaceutical Scientist-Wagner, J.C., Technomic Publishing AG, Switzerland, 1993.
5. Biopharmaceutics and Pharmacokinetics-Notari, R.E., 2nd ed., Marcel Dekker, New York, 1975.

Course specification of Medicinal chemistry II

Course Specifications
Department offering the programme: -Medicinal chemistry
Department offering the course: - Medicinal chemistry
Academic year / Level third year /Second semester
Date of specification approval

A- Basic Information

Title: Medicinal Chemistry I Code:
Credit Hours: 3hr Lecture:2
Tutorial: Practical: 1 Total:

1 – OVERALL AIMS OF COURSE

4. To provide the knowledge of chemistry of drugs with special references to their pharmaceutical and medicinal usage.
5. To provide the knowledge about the relationship of chemical structure and therapeutic properties.
6. To correlate medical chemistry facts with manufacture drugs & clinical application

2-INTENDED LEARNING OUTCOMES:

A- KNOWLEDGE & UNDERSTANDING:

a1-Understand the principles of medicinal chemistry.
a2- Describe the basic principles of mechanism action for active groups in pharmaceutics chemistry
a3-Explain the different reaction between active groups in pharmaceutics chemistry special in preparations of drugs
a3-Explain of nomenclature chemically of medical chemistry.

B- INTELLECTUAL SKILLS

b1- Apply preparation (synthesis) of medical compound drugs
b2- Identify the different of medical compound drugs by assay& titration
b3- Determine medically used & roles of important medical compound drugs.

C-PROFESSIONAL AND PRACTICAL SKILLS

c1- Maintain the name of chemical compound &derivatives or chemical modification effects.
c2- Classification of medical compound drugs according to medically used& active group.

d- GENERAL AND TRANSFERABLE SKILLS

d1. Work separately or in a team to research and prepare a scientific topic.
d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.

3- Content

NO	Topic	No .of hour	Lecture	Tutorial-practical
The following topics shall cover Nomenclature, classification, synthetic procedures of compounds mentioned under each category, structure activity relationship, mode of action and therapeutic use.				

Cardiovascular drugs ❑ Antianginal agents and vasodilators ❑ Antiarrhythmic drugs ❑ Antihypertensive drugs ❑ Antihyperlipidemic drugs ❑ Anticoagulant drugs			
Diuretics ❑ Carbonic anhydrase inhibitors ❑ Thiazides diuretics ❑ Loop diuretics ❑ Potassium-sparing diuretics ❑ Miscellaneous			
Local anesthetic agents ❑ Mechanism of action of LA ❑ Classifiation ❑ Clinical uses ❑ Individual drugs			
Antihistamines ❑ H1-antihistamines ❑ H2-antihistamines			
Analgesics ❑ NSAID ❑ Opioid analgesics			
Steroids(hormons) ❑ -Steroidal Hormones, their semisynthetic analogs and antagonists - Female sex hormones - Male sex hormones - Adreno corticoides ❑ Insulin and oral hypoglycemic agents ❑ Oral hypoglycemic agents ❑ Thyroid hormones ❑ Antithyroid drugs			

4– Teaching and Learning Methods

4.1- Lectures
4.2- Tutorials
4.3- Practical
4.4- visiting to pharmaceutical industry companies.

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Midterm exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding
5.4- Practical exam	to assess the practical skills.

Assessment Schedule

Assessment 1 midterm exam	Week 6
Assessment 2 practical	week 12
Assessment 3 final exam	Week 14

Weighing of Assessments

Mid-Term Examination	20	%
Final-term Examination	60	%
Practical Examination	20	%
Total	100	%

***- List of References**

3. Wilso; Gisvold, Doerge, Text book of organic medical pharmaceutical chemistry 7th edition –J . B. Lippincot.
4. Remington's pharmaceutical sciences,

Facilities Required for Teaching and Learning

* White board & Markers.
* Over head projector.

Course specification of Phytochemistry II

Level: 3rd year/ second semester
Credit hour:3 lecture:2 practical :1
Prerequisite: Pharmacognosy

Aims (Module purpose):

Based on the information acquire from the pre-requisite courses of Pharmacognosy, pharmacology and instrumental analysis, Phytochemistry course discusses the major pharmaceutically important secondary metabolites from natural sources (phenolics, steroids, terpinoids, glycosides and alkaloids) of pharmaceutical interest. It provides the basic phytochemical knowledge about the natural source, classification, extraction, detection, isolation, pharmacological and toxicological effects. The course extends to the chemistry of natural pesticides as well as drugs of marine origin.

Teaching methods:

Lectures and seminars.

Learning outcomes:

By the end of this course, students should be able to:

7. Understand the scope and importance of Phytochemistry in drug discovery and modern medicine.
8. Recognize the chemical structure, medicinal value, natural source, detection, isolation, characterization and medicinal applications of glycosidic phenols, steroids and terpenes and their importance in orthodox medicine.
9. Recognize the medicinally important alkaloids, their chemical structure, natural sources, detection, isolation and characterization and medicinal applications.
10. Use and recommend natural pesticides and their applications for pharmaceutical industry.
11. Understand the importance and recognize the sources of marine drugs, their toxicities and their promising medicinal applications.
12. Identify and understand the nature, source, production, and medicinal uses of naturally occurring antibiotics.

Module outline:

week	subject
1.	**Glycosides** Introduction : (Definition, classification, distribution extraction and isolation, pharmacological properties). **Cardioactive glycosides** : (cardenolides, bufadienolids, sugars, structure- activity-relationship, distribution, extraction, chemical and physical properties, hydrolysis of cardiac glycoside, biogenesis, pharmacological properties, mechanism of action, chemical tests, chief drugs containing cardiac glycosides, Digitalis, Strophanthus, Adonis, Convalaria and Squill).
2.	Glycosides **Saponin-glycosides** : (Definition, distribution, classification, structures, biogenesis, extraction, chemical and physical properties, Characterization biological and pharmacological properties, drugs as expectorant and

	antitusive, anti-exudative, Adaptogens and as diuretic). **Anthracen glycosides** : (distribution, classification, structures, biosynthesis, extraction, chemical and physical properties, characterization, pharmacological properties, Senna, Rhamnus, Rhabarub and Aloe).
3.	Glycosides **Flavonoid glycosides** : (Classification, biosynthesis, chemical structur, physico-chemical properties, extraction, characterization, biological properties, rutin, hesperidin and Flavonoid containing drugs). **Cyanogentic glycosides** : (Cynogenesis, distribution, structure, biogenesis properties, detection, extraction, pharmacological activities, and cyanogenetic plants). Glucosinolates (Thioglycosides) : (Definition, distribution, structure, biogenesis, Hydrolysis, toxicity and drugs containing glucosinolates).
4.	Terpenoids: Introduction (definition, classification, biosynthesis and distribution).Monoterpens: (regular- and irregular monoterpenoids, irodoids, structures, chemical and physical properties and drugs containing monoterpenoids).
5.	Terpenoids: Sesquiterpens and sesquiterpen lactones: (structures, chemical and biological properties, and drugs containing sesquiterpenes and sequiterpene lactones). Diterpenes : (structures, Chemical and biological properties, and drugs containing diterpenes).
6.	Terpenoids: ○ Triterpenes : (classification, structures, and drugs containing triterpenes). ○ Tetraterpenes : (chemical and biological properties, vitamin A, and drugs containing tetraterpenes) .
7.	Tannins Definition, classification, structure, hydrolyzable- and condensed-, complex- and pseudo-tannins, distribution, biosynthesis, physico-chemical properties characterization, extraction, biological properties and drugs containing tannins).
8.	Phenylpropane-derivatives ○ Introduction : (definition, classification, and biogenesis). ○ Phenols and phenolic acids : (Structures, physico-chemical properties. ○ characterization, extraction, pharmacological properties and drugs containing Phenols and drugs conraining phenols and phenolic acids).
9.	**Coumarins** : ○ (Definition, chemical structures, classification, biosynthesis, physico-chemical properties, characterization, extraction, pharmacological properties and uses, drugs containing coumarines, furocoumarin, pyranocoumarines).
10.	**Lignan**s : (definition, classification, distribution, biological and pharmacological properties, and drugs containing lignans). **Lignin** : (definition, structure, biological and pharmacological properties of some lignins).

11.	Volatile oils : o Definition, classification, distribution and occurrence o Preparation : distillation methods and solvent extraction. o Chemical and physical and pharmacological properties.
12.	Volatile oils : Drug containing volatile oil used as counter-irritating agents, expectorants, and diuretic and as stomachic and carminative.

Mode of assessment:

Modes of assessment	score	Date
First exam	20	6th week
Second exam		12th week
Assignment Seminar Project Quizzes tutorial	10	4th ,5th ,10th
Final Exam (comprehensive; written, verbal, hand-ins…etc)	40	16th week

Text Books and Supporting Materials:

Text book:

1. Pharmacognosy, Phytochemistry, medicinal plants by Jean Brueton (1995), english edition.
2. Harmacognosy and phamacobiotechnology by James E. Robbers, Marilyn k. Speedie and Varro E. Tyler (1996). Williams and Wilkins.

In addition to the above, the lecturer will provide the students with handouts.

References:

Students will be expected to give the same attention to these references as given to the Module textbook(s)

1-drugs of natural origin, a textbook of pharmacognsy by Gunnar Samuelsson (1992)

2- Tearse and Evans Pharmacognosy by WC Evans, 15th edition (2002)

Course specification of Parasitology

Academic year: Third /second semester
Credit hours: 3lecture: 2 practical:0

Course Description:

Parasitology: This course is the science which studies living organisms (parasite) that may live inside human body or outside it. These parasites may cause direct harm to man or transmit pathogens to him.

General objectives of the course:

1. Understanding the classification of parasites.
2. Understanding the morphology and life cycle of parasites.
3. Understanding the treatment, prevention and control of parasites.
4. Recognize the modes of parasitic infections and the role of vectors in disease transmission.
5. Differentiate between various stages of each parasite.

Course contents:

- **Introduction of parasitology:**
  - Definition of parasites
  - Types of hosts.
  - Types of vectors and source of infections.
  - Basic rules of classifications (Phylum, class, order, family, genus, species, genus and species name).
  - Epidemiological terms of common use in parasitology
  - Summery on:
    - Host immune response
    - Pathogenesis
    - Diagnosis
    - Treatment
    - Prevention and control
- **Trematoda:**
  - General chaacters of trematoda.
  - ***Schistosomiasis*:**
    - Historical introduction
    - Epidemiology and geographical distribution
    - Description of the organism
    - Classification of the organism
      - *S. mansoni, S. hematobium and S. japonicum*
    - Characteristics of different types of schistosomes
    - Morphological types
    - Transmission
    - Life cycle
      - Egg and meracidia, snails (types), cercaria, skin penetration, somatic migration, lifespan, egg release
      - Intermediate hosts
    - Pathology
      - Egg granuloma, hepatoslenomegally, urinary bladder cancer and immunology
    - Clinical features (symptoms and signs)
    - Prevention and control of transmission.
  - ***Fasciola (hepatobiliry flukes)***
    - Historical introduction
    - Epidemiology and geographical distribution
    - Description of the organism

❑ Classification of the organism ▫ *F. hepatica and F. gigantica* ❑ Characteristics of different types of Fasciolidae ❑ Morphological types ❑ Transmission ❑ Life cycle ❑ Pathology and immunology ❑ Clinical features (symptoms and signs) ❑ Methods of laboratory diagnosis. ❑ Prevention and control of transmission. **Cestoda (Tapeworms):** ❑ General features of cestoda. ❑ Geographical distribution., description of organism, transmission, morphology (worms, eggs & larva), life cycle, pathology, immunology of the following organisms: ❑ ***Taenia saginata*** ❑ ***Taenia solium and cysticercosis*** ❑ ***Hymenolepis nana*** ❑ ***Hymenolepis diminuta*** ❑ ***Diphyllobothrium latum*** ❑ ***Diphyllobothrium mansoni*** ❑ ***Echinococcus granulosus, hydatidosis and coenurosis*** ❑ ***Dipylidium caninum*** ❑ ***Laboratory diagnosis for each organism*** Prevention and control for each organism	

Methods of teaching:

- Lectures
- Discussion
- Board
- Light microscope,
- Overhead projector
- CDs
- Laboratory and laboratory equipments

References:

Stephen HG, Richared DP***: Principles and Practice of clinical parasitology***, Jhon Wiely & Sons Ltd; New York **2001**.

Ursus-Nikolaus Riede, Martin Werner: ***Color Atlas of Pathology: Pathologic Principles· Associated Diseases***; Thieme Stuttgart· **New York 2004**

Stephen HG, Richared DP***: Principles and Practice of clinical parasitology***, Jhon Wiely & Sons Ltd; New York **2001**.

Course Specifications for public health

Course Specifications

Department offering the programme: - Pharmacy
Department offering the course:- Community health.

Academic year / Level: fourth year /second semester.
Date of specification approval:

A- Basic Information

Title: Public health Code:

Credit Hours: 2 hrs Lecture: 2hrs

Tutorial: None Practical: None Total: 2 hrs

B- Professional Information

1 – Overall Aims of Course

* This course is designed

5- to provide the student with knowledge, skills and attitudes in the field of environmental health & Nutrition.
6- Also to help the student to acquire knowledge, skills and attitudes in the field of health education and Family planning, enable him/her to participate efficiently in solving some of health problems affecting the community.
7- understand the constituents of the food for the daily requirements of the body in health and illness and their sources, functions and deficiencies.
8- participate effectively in the health education process & Family planning .

2 – Intended Learning Outcomes of Course (ILOs):

a- Knowledge and Understanding:

a6 Identify health problems available in the environment that affect
a7 the community.
a8 Undertake the necessary steps for solving some of health problem affecting the environment and the community.
a9 Understand knowledge in proper Nutrition.
a10 Recognize the constituents of food, their sources, functions, deficiencies and daily requirements in health and illness.

b- Intellectual Skills

b1- Prepare simple Materials for the purpose of health education.

D- Professional and Practical Skills

c1- Accepts Attitude on health team working.
c2- Participate in health education activities in his field.

d- General and Transferable Skills

d1- Advice patients, workers….etc about the proper family planning method
d2- Communicate effectively with clients.

3- Contents

Topic	No.of hrs	Lecture
ENVIRONMENTAL HEALTH		
Introduction Definition: importance to practicing pharmacists. Epidemiology; quarantinable diseases; international public health programs.		
A**. Health conception** of health. • Public health. • Environment. • Environmental health B**. Personal health** :- • Food and drink. • Clothing.- cleanliness. • Physical exercises. • Rest and sleep. - habits. • Personal protection against infectious diseases. • Periodic medical examination.		
Water and Food Hygiene **A**. **<u>Water ;</u>** • Importance of water. • Composition of water. • Water requirement for man. • Sources of water. • Hard and soft water. • Contamination of water. • Diseases transmitted by water. • Steps for treating water. **B**. **<u>Food hygiene :</u>** • Definition of food • Definition of food hygiene. • Preservation of food.		

• General requirements relating to food premises. • Cleanliness of equipment.		
B. <u>Disposal of Human wastes</u> • Sanitary principles of waste disposal • Methods of disposal		

4– Teaching and Learning Methods

4.1- Lectures, Discussion.
4.2- Role - Play.

5- Student Assessment Methods

Evaluation of the students will be done by:

5.1 Semester Work. to assess Intellectual ,General and Transferable Skills
5.2 Reports. to assess Intellectual , Professional and Practical Skills.
5.3 MCQs& Examination. to assess Knowledge, Understanding ,Professional Skills.

Assessment Schedule

Assessment 1 Semester Work	Week (4-6)
Assessment 2. Midterm Examination	Week (8)
Assessment 3. Formative exam	Week (12)
Assessment 4. Final Examination.	Week (16)

Weighting of Assessments

Semester Work.	10 %
Midterm Examination	20%
Final Examination	70 %
Total	100%

6- List of References

6.1- Course Notes
Handout .
6.2- Essential Books (Text Books)
Library books
6.3- Recommended Books

7. Community health Nursing (Promoting & protecting the public health) Allender , Judith.
8. Use of guidelines for making pregnancy safer and family planning, W.H.O
9. Evad.Wilson and others (Principles of Nutrition) 4th edition. Wilcy & Sons - New York.
10. Kranse and Mahan (Food, Nutrition and Diet Therapy) 7th edition W.B. Saunders Company - Philadelphia.
11. World Health Organization - A manual on health education in primary health Care - W.H.O. Geneva - 1988.

12. John Gibson, Health Personal and Communal. 4th edition 1976. Faber and Faber - London and Boston.

6.4- Periodicals, Web Sites … etc

Course specification of Pharmacology III

Course Specifications

Department offering the programme**:-.**

Department offering the course**:-**

Academic year / Level: 4th year /2nd semester**.**

Date of specification approval:

A- Basic Information

Title: Pharmacology III Code:
Credit Hours: 4hrs Lecture: 3hr
Tutorial: Practical: 0 Total:

B- Professional Information

1 – Overall Aims of Course

9. Giving a knowledge about the pharmacokinetic of drugs (absorption, distribution, metabolism and excretion).
10. Pharmacodynamic of drugs (mechanism of drug action & their biological effects on different body organs and drug-protein binding) and dosage form of drugs (advantages & disadvantages).
11. Uses &Adverse drug reactions & their side effects (drug toxicity, abuse, and their misuse).
12. Giving the types of drug-drug interactions.

2 – Intended Learning Outcomes of Course (ILOs)

k- Knowledge and Understanding:

a1- Define the drugs affecting G.I.T & R.S.
a2- Identify action and indication of the drugs.
a3- Recognize the side effects of various drugs .
a4- Explain Mechanism of these drugs.
a5- Explain the reasons for various indication of the drugs.
a6- Identify various drugs used in hospitals, polyclinic and pharmacy sections**.**

Intellectual Skills

b1- Read the dive prescribed drugs.

b2- list precaution to be taken for each drug.
b3 -Explain how to deal with patient when side effect occurred.

l- Professional and Practical Skills

c1-Differentiate between the side effect and adverse effect.
c2- Identify the abbreviations used in pharmacology**.**

m- General and Transferable Skills

d1-Apply principles of human needs.
d2- Great a management plan for drugs administration**..**
d3- Evaluate a management plan for drugs administration**..**

3- Contents

	No. of lecture	**No. of hours**
(1) Chemotherapeutic Drugs; Introduction to chemotherapy B-Lactam Antibiotics and other inhibitors of the cell wall. synthesis. Penicillins.	1	2
(2) Cephalosporins , Imipenems and monolactams.	1	2
(3) Chloromphenicol, Tetracyclines, Macroids and Clindamycin Aminoglycosides and other drugs used to treat gram - negative infection	1	2
(4) Cancer Chemotherapy; Introduction, Poly functional alkylating agents.	1	2
(5) Plant alkaloids and Antibiotics.	1	2
(6) Hormonal agents and Miscellaneous anticancer agents.	1	2
(7) Immunopharmacology; Introduction and Immunosuppresive agents..	1	2
(8) Immunomodulating agents	1	2
(9) Cancer immunotherapy and Gene therapy.	1	2
(10) Endocrine Hormones; Pancreatic Hormones.	1	2
(11) Anti-diabetic Drugs.	1	2
(12) Hypothalamic, Pituitary Hormones and Synthetic analogue.	1	2
(13) Thyroid and Anti-thyroid Drugs.	1	2
(14) Adrenocorticosteroids & Adrenocortical antagonists.	1	2
Total	**14**	**28**

4– Teaching and Learning Methods

4.1- Lectures, Discussion.
4.2- Group discussion.
4.3- practical

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Mid term exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding
5.4- Practical exam	to assess the practical skills.

Assessment Schedule

Assessment 1 mid term exam	Week 6
Assessment 2 practical	week 12
Assessment 3 final exam	Week 14

Weighting of Assessments

Mid-Term Examination	20	%
Final-term Examination	60	%
Practical Examination	20	%
Total	100	%

6- List of References

6.2- Essential Books (Text Books)

1- Rang, Dale and Ritter Pharmacology (2000)
2-Katzung –Basic and Clinical Pharmacology (2001)
3-Tripathi –Essential Pharmacology (2001)
4-Laurence, Bennett and Brown-Clinical pharmacology (1997)
5-Goodman & Gilman's- The pharmacological basic of therapeutics (1995)
6-British National Formulary (BNF) (2002)
7-The Washington manual of medical therapeutics (2000).
8- Grahame-Smith and Aronson –Oxford Textbook of Clinical Pharmacology and Drug therapy (1987).
9-Medical Pharmacology at a Galance (1998).

6.3- Recommended Books

6.4- Periodicals, Web Sites … etc


FIFTH YEAR/
FIRST SEMESTER

Course specicification of Medicinal Chemistry III

Course Specifications

Department offering the programme: -Medicinal chemistry

Department offering the course: - Medicinal chemistry

Academic year / Level fifth year /first semester

Date of specification approval

A- Basic Information

Title: Medicinal Chemistry III Code:
Credit Hours: 3hr Lecture: 2
Tutorial: Practical: 1 Total: 3

1 – OVERALL AIMS OF COURSE

1- To provide the knowledge of chemistry of drugs with special refrences to their pharmaceutical and medicinal usage.
2- To provide the knowledge about the relationship of chemical structure and therapeutic properties.
3- To correlate medical chemistry facts with manufactuer drugs & clinical application

2-INTENDED LEARNING OUTCOMES:

A- KNOWLEDGE & UNDERSTANDING:

a1-Understand the principles of medicinal chemistry.
a2- Describe the basic principles of mechanism action for active groups in pharmaceutics chemistry
a3-Explain the different reaction between active groups in pharmaceutics chemistry special in preparations of drugs
a3-Explain of nomenclature chemically of medical chemistry.

B- INTELLECTUAL SKILLS

b1- Apply preparation (synthesis) of medical compound drugs
b2- Identify the different of medical compound drugs by assay& titration
b3- Determine medically used & roles of important medical compound drugs.

C-PROFESSIONAL AND PRACTICAL SKILLS

c1- Maintain the name of chemical compound &derivatives or chemical modification effects.
c2- Classification of medical compound drugs according to medically used& active group.

d- GENERAL AND TRANSFERABLE SKILLS

d1. Work separately or in a team to research and prepare a scientific topic.

d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.

3- Content

NO	Topic	No .of hour	Lecture	Tutorial-practical
- The following topics shall cover Nomenclature, classification, synthetic procedures of compounds mentioned under each category, structure activity relationship, mode of action and therapeutic use.				
	Cardiovascular drugs			
	❑ Antianginal agents and vasodilators ❑ Antiarrhythmic drugs ❑ Antihypertensive drugs ❑ Antihyperlipidemic drugs ❑ Anticoagulant drugs			
	• **Diuretics** • Carbonic anhydrase inhibitors • Thiazides diuretics • Loop diuretics			
	Steroids(hormons) **Hormones** • Steroidal Hormones, their semisynthetic analogs and antagonists • Female sex hormones • Male sex hormones • Adreno corticoides • Insulin and oral hypoglycemic agents • Thyroid hormones and anti-thyroid Agents • Vitamins			
Total hours				

4– Teaching and Learning Methods

4.1- Lectures
4.2- Tutorials
4.3- Practical
4.4- visiting to pharmaceutical industry companies.

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Mid term exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding

5.4- Practical exam	to assess the practical skills.

Assessment Schedule

Assessment 1 midterm exam	Week 6
Assessment 2 practical	week 12
Assessment 3 final exam	Week 14

Weighing of Assessments

Mid-Term Examination	20	%
Final-term Examination	60	%
Practical Examination	20	%
Total	100	%

***- List of References**

5. Wilso; Gisvold, Doerge, Text book of organic medical pharmaceutical chemistry 7th edition –J . B. Lippincot.
6. Remington's pharmaceutical sciences,

Facilities Required for Teaching and Learning

* White board & Markers.
* Over head projector.

Course specicification of drug quality control

Course Specifications

Department offering the programme: - pharmaceutics

Department offering the course: -

Academic year / Level: Fifth /First semester

Date of specification approval

Basic Information

Title: drug quality control Code:
Credit Hours: 3 Lecture: 2
Tutorial: Practical: 1 Total:3

Objectives:

At the end of the course, the students are expected to:

(1) Know the sources of quality variation

(2) Understand the testing programmes and methods for assuring quality and compliance with official standards and specifications.

(3) Appreciate the tremendous professional, social and legal responsibilities associated with the assurance of product quality.

Course Contents:

1. General principles of drug quality control and assurance systems
2. Structural organization and functions of a Quality Control Department
3. Sources of impurities in pharmaceutical substances, sources of quality variation of pharmaceutical products
4. Environmental control of manufacturing area
5. Monographs and specifications for drugs and drug products. Critical evaluation of the Pharmacopoieas including the African Pharmacopoiea and the role of WHO in drug quality assurance.
6. Application of chemical and physicochemical analytical techniques in purity determination, identification and quantitation of drugs in pharmaceutical and radiopharmaceutical

preparations, including multicomponent formulations from a regulatory and quality control standpoint

7. Evaluation of crude drugs
8. Microbiological evaluation of sterile and non-sterile pharmaceutical products

Practical:

Practical work will involve comprehensive analysis of some selected raw materials and finished drug products using a combination of analytical principles treated in the theory. It will be supplemented by visits to local manufacturing units where the student may examine the practice of quality control.

4– Teaching and Learning Methods

4.1- Lectures
4.2- Tutorials

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Mid term exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding

Assessment Schedule

Assessment 1 mid term exam	Week 6
Assessment 3 final exam	Week 14

Weighting of Assessments

Mid-Term Examination	20	%
Final-term Examination	60	%
Participation& semester work	20	%
Total	100	%

***- List of References**

***- Facilities Required for Teaching and Learning**

* White board & Markers.
* Over head projector.

Course specification of Clinical Pharmacy I

Department offering the programme**:- Pharmaceutics**

Department offering the course**:- pharmaceutics**

Academic year / Level: fifth **year** /1st semester.

A- Basic Information

Title: Clinical Pharmacy Code:
Credit Hours: 3 Lecture: 2
Tutorial: Practical: 0 Total:

B- Professional Information

1 – Overall Aims of Course

1. Giving knowledge about the diagnosis of disease.
2. Analysis the all information about patient's state according the patient history, clinical features and laboratory findings.
3. Solve the given case according to the correct therapeutic way.
4. Detect the complications of the diseases.
5. Recognize the safety of drugs in special groups like children, elderly and pregnancy..

2 – Intended Learning Outcomes of Course (ILOs)

n- Knowledge and Understanding:

a1- Define the Epidemology,Etiology,Risk factors for particular condition under study.
a2- Recognize the Clinical features & laboratory tests for each case study .
a3- Mention the therapeutic approaches, both pharmacological and non-pharmacological in details .
a4- Identify Mechanism of these drugs.
a5- Explain the reasons of clinical complications &drug interaction .
a6-Understand the principals of human anatomy, histology, pathology and physiology that relevant to clinical pharmacokinetic of drugs.
a7-To acquire knowledge about drugs and their uses therapeutically concerning their identities, safety, optimum use in medication and contraindications.
a8- Knowledge about the correct diagnosis of diseases.
a9-Recognition of disease state, pathology and management of symptoms.
a10-To get knowledge about recent researches, articles and advanced studies on drugs treating many diseases

b- Intellectual Skills

b1- list precaution to be taken for each prescribed drugs individually or in combination.
b2 -Explain how to deal with patient when side effect occurred.
b3-The student can diagnosed disease according to their manifestations, investigations and physical examinations
b4-Interpret the clinical features and the diseases related to them.

b5-Solve the case studies according to the therapeutic way.
b6-Interpret patient and clinical data, including patient records held within practice settings.

c- Professional and Practical Skills

c1-Acquire skills to diagnosed the case studies precisely.
c2-Evaluate critically observations and measurements, in terms of their significance and theory underlying them.
c3-Give advises for the patients and others on the safe and effective use of medicines
c4- Acquire the skill of drug monitoring therapy.

d-General and Transferable Skills

d1-Improve the communications with the patients or physicians.
d1-Apply principles of human needs.
d2- Great a management plan for drugs administration..
d3- Evaluate a management plan for drugs administration.
d4-Interact effectively with patients, the public and health care professionals; including communication both written and oral.
d5-Solve the problem base relating to given information like patient history.
d6-Writing a report for criticizing of suitable drugs for each case
d7-Behave with an ethical attitude and approach.

3- Contents

Topic		No. of hours	Lect	Tutorial/Practical
General introduction to Therapeutics	will be studied in each individual disease state • Definition, • Etiology, • Pathology, • Pathophysiology, • Epidemiology, • History, • Clinical features, • Investigations diagnosis, • Management • Drug selection ... Etc;.			
The Cardiovascular System.	• Hypertension. • Angina pectoris. • Congestive heart failure. • Acute myocardial infraction. • Thromboembolic diseases.			
Respiratory System.	• Cough therapy • Bronchial asthma • Chronic obstructive pulmonary disease (COPD) • Upper respiratory infections (URI)			

Gastrointestinal System.	• Peptic ulcers. • Hepatitis.			
The Endocrine System.	• -Diabetes mellitus • -Thyroid and Parathyroid disease.			
Renal System.	• -Renal failure. • -Urinary tract infections.			
Total hours				

4– Teaching and Learning Methods

4.1- Lectures, Discussion.
4.2- Group discussion.
4.3- visiting hospital to take patient history and medication profile.

5- Student Assessment Methods

5.1- Participation& semester work to assess intellectual skills
5.2- Mid term exam to assess the knowledge & understanding
5.3-Final term exam to assess the knowledge & understanding
5.4- Practical exam to assess the practical skills.

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Assessment Schedule

Assessment 1 **Formative assessment**. Week **(2)**
Assessment 2 **Mid-Term Examination** Week **(6)**
Assessment 3 **Formative assessment**. Week **(9)**
Assessment 4 **Final written exam**. Week **(12)**

Weighting of Assessments

Mid-Term Examination 20 %
Final-term Examination 60 %
Practical and Semester Work 20 %
Total 100%

6- List of References

6.1- Course Notes
Handout Texts

6.2- Essential Books (Text Books)

1. Walker and Edwards (eds). Clinical Pharmacy and Therapeutics Third edition (2003).
2. Applied Therapeutics: The Clinical Use of Ddrugs. Koda-kimble.

6.3- Recommended Books

1. Walker and Edwards (eds). Clinical Pharmacy and Therapeutics Third edition (2003).
2. Applied Therapeutics: The Clinical Use of Drugs. Koda-kimble.

7- Facilities Required for Teaching and Learning

- White board & Markers.
- Over head projector.

Course specification of Industrial pharmacy I

COURSE SPECIFICATIONS:

-Department offering the course:
Academic year \ level: - fourth year /first semester

BASIC INFORMATION:

Title: Industrial pharmacy Code:
Credit Hours: 3 Lecture: 2
Tutorial: 2 Practical: 2 Total: 3

PROFESSIONAL INFORMATION

1-AIMS OF THE COURSE:

1. To provide a basic specialised knowledge in the areas of analytical techniques, research and development, production and quality assurance with reference to industrial pharmacy
2. Explore in detail the types of equipments &instruments used in the preparation, separation, extraction & sterilization.
3. Carryout a good manufacturing practice.
5. Develop the basic scientific research skills as well as effective communication and team work attitudes.

2-INTENDED LEARNING OUTCOMES:

a-KNOWLEDGE and UNDERSTANDING:

a1. Describe the steps of manufacturing of injections, tablets, capsules &drops.
a2. Describe & explain the methods of drug separations.
a3. Describe & explain all the lines of drugs industry.

b-INTELLECTUAL SKILLS:

b1. Interpret the most important unwanted drug changed that may occur after preparation e.g.: contamination, separation…
b2. Comment, on some clinical parameters such as: ABP, ECG, nerve conduction velocity pulmonary functions for a normal individual.
b3. Integrate industrial pharmacy with other pharmacy sciences e.g. pharmaceutics, medicinal chemistry.

c-PRACTICAL SKILLS:

c1. Perform the most important separations tests: evaporation, filtration, crystallization, &extraction.

d-GENERAL SKILLS AND ATTITUDES:

d1. Work separately or in a team to research and prepare a scientific topic.
d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.
d3. Present industrial data in a graphical form.

3-COURSE CONTENTS:

Unit	Topic	No. of hours	Lecture	Practical
Particle Size reduction	• Mechanism of size reduction • Factors influencing size reduction	4	2	

	• Pharmaceutical application • Energy requirements • Types of mills • Closed circuit grinding			
Particle Size separation	• Size separation standard screens • Oscillating tray sitter grating sifters • Cyclone separators • Sedimentation • Elutriation • Handling of powders	2	1	

Filtration	• Mechanism of Filtration
	• Factors affecting filter selection
	• Filter media
	• Filter selection
	• Filter aids
	• Classification of filters
	  ○ Leaf filters
	  ○ Rotator continuous
	  ○ Meta filters
	  ○ Membrane filters
		4	2	

Packaging Technology	- Packaging materials - Glass & Glass containers - Metal & Metal containers - plastics & Plastic containers - Paper & Board - Films, foils & laminates - Rubber - Based compounds - Closures - Filling - Labeling	4	2	
centrifugation	• Centrifuge theoretical consideration • Laboratory equipments • Large scale equipments • Low temperature centrifuge for biological work.	2	1	
Extraction	• Extraction leaching process • Factors affecting the efficiency of leaching process. • Diffusion batteries • Continuous diffusion batteries • Continuous counter current extraction • Cragg's apparatus	4	2	

Crystallization	• Crystallization classification
	  ○ Batch crystallizers
	  ○ Simple vacuum crystallizers
	• Nucleation and crystal growth
	• Critical humidity prevention of caking
		2	1	

Mixing	• Mechanism of mixing • Mixing equipments • Mixing selection • Solid-solid, solid-liquid and liquid –liquid mixers used in pharmaceutical industry.	2	1	

Drying	• Classification of dryers
	  ○ Compartment
	  ○ Tunnel
	  ○ Rotary
	  ○ Cylindrical
	  ○ Vacuum
	  ○ Spry driers
	  ○ Fluidized bed dryers.
	• Theory of drying loss on drying and moisture content.
	• Equilibrium moisture content
	• Principles of freeze drying and freeze dryers.
		4	2	

	TOTAL	28	14	

Teaching and Learning Methods:

1- Lectures.
2- Discussion.
3- Visiting of pharmaceutical industries

Student Assessment Methods:

5.1- Participation& semester work — to assess intellectual skills
5.2- Mid term exam — to assess the knowledge & understanding
5.3-Final term exam — to assess the knowledge & understanding
5.4- Practical exam — to assess the practical skills.

Assessment schedule:

Assessment 1- Semester work — weak 4
Assessment 2- Mid term exam. — weak 8
Assessment 3- Final term exam. — weak 18

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Weighting of Assessments

-Semester work 10%
-Mid term exam 20%
-Final term exam 70%

Total	100%

List of References:

1. Theory and Practice of Industrial Pharmacy-Lachman,Lieberman and Kanig
2. Bentley's Text Book of Pharmaceutics - Rawlin.
3. Tutorial Pharmacy - Cooper and Gunn.
4. An introduction to Chemical Engineering - Badger and Banchero.

Course specicification of applied Pharmacognosy

Programme(s) on which the course is given: Pharmacy

Major or minor element of programmes

Department offering the programme: Pharmacy
Department offering the course: Pharmacognosy Dept.

A-BASIC INFORMATION

Title: Applied pharmacognosy *Code:*
Credit Hours: 3hrs *Lecture:* 3hr
Tutorial: within practical classes. *Practical:* 1 hr

B- PROFESSIONAL INFORMATION

1- ***Overall Aims of Course***

Giving the student basic and deep knowledge about the following:

1. Formulation of herbal mixtures
2. Quantitative and qualitative evaluation of medicinal plants
3. Identification of major constituents

2- ***Intended Learning Outcomes of course (ILOs)***

A- ***Knowledge and Understanding*****:**

A1- Giving the knowledge about formulation of suitable herbal drug

A2- Know different methods used to detect adulterants of natural products
A3- Identify the major active constituents
A4- Know different types of isolation of active constituents through chromatography

B- ***Intellectual skills*****:**

B1- Think for solving problems
B2- Search for suitable method for herbal drug administration
B3- Establish a suitable method for herbal drug analysis

C- ***Professional and practical skills*****:**

C1- Carry out simple and adequate method for identification of major herbal drug constituents.
C2- Find methods for isolation of some herbal a drug constituents
C3- Acquire skills to detect adulteration of any supplied natural drugs.
C4- Determine the Pharmacopeial constants of herbal drugs

D- *General and transferable skills*:

D1- Communication skills.
D2- Skill to compound herbal teas for treatment of some ailments.
D3- Writing a report for criticizing an herbal drug.
D4- Comparing traditional and medicinal uses of herbal drugs

3- ***Contents*****:**

No.	Topic	Lectures	No. of hours

1	**Production of medicinal plants**	**2**	**6**
2	**Evaluation of medicinal crude drugs**	**2**	**6**
3	**Biosynthesis of natural products**	**2**	**6**
4	**Methods of Pharmacognosy used in quality control** Droplet Counter Current Chromatography. Ash value Moisture Content Radioimmunoassay Derivatization in HPLC	**2**	**6**
5	**Structure elucidation:** Physical properties, chromatograpic data (GC, HPLC, Ion exchange), determination of molecular formula, spectroscopic data (UV, IR, mass NMR).	**2**	**6**
6	**Drugs of biological origin:** Traditional medicine and medicinal plants : traditional medicine and methods utilized in traditional medicine, herbal medicine, vertues and shortcomings, the scientific basis of herbal medicine, treatment of constipation, asthma, inflammation and peptic ulcer, therapeutic effects of ginseng.	**2**	**6**
7	**Tissue culture and molecular biology** Basic principles of plant tissue culture, techniques, callus culture, cell culture, organ culture, meristem culture, protoplast culture, biotransformation using cell culture, cryopreservation of germplasm, plant cell immobilization	**2**	**6**
		14	**42**

4- ***Teaching and learning methods***

Computer, data show, white board, marker, OHP

Practical

Microscopes, laboratory chemicals, fresh, dried and powdered natural drugs, electric microtone.

5- ***Student assessment method***

5.1- Practical

5.2- Written exam

5.3- Oral

Assessment schedule:

Assessment	**Time**
Periodical written exam I	Week 7
Practical student note	Evaluated periodically every week

Practical exam	Week 14
Final Written and oral exams	As decided by vice dean of student affairs

Weighing off assessments:

Exam	**Mark**	**%**
Written	60	60%
Midterm	20	20%
Practical notes	5	5%
Practical exam	15	15%

6- ***List of references***

6.1- Textbooks:

1- Trease, G.E. and Evans, W.C. Pharmacognosy (1994).
2- British Pharmacopeia
3- Chromatography books
4- Biosynthesis of natural drugs
5- Silverstien spectral analysis

6.3- Websites in the international network (internet).

7- ***Facilities required for teaching and learning***

Microscopy, chemicals, computers, data show, O.H.P.

Course specification Community Pharmacy practice

A- BASIC INFORMATION

Title: community pharmacy practice Code:
Credit Hours: 2 hr Lecture:2
Tutorial: 2 Practical: Total**: 2**

B- PROFESSIONAL INFORMATION

1 – OVERALL AIMS OF COURSE

3. Provide the student with roles of community pharmacist
4. Learn the student with the methods of patient assessment and care as they relate specifically to the drug and non-drug management of minor ailments.
5. The student able to asses the pathogenesis, clinical features, management and treatment outcomes of some disorders.

2 – INTENDED LEARNING OUTCOMES OF COURSE (ILOS)

o- KNOWLEDGE AND UNDERSTANDING:

a1- Explain the roles of community pharmacist.
a2- Enumerate the non-prescription drugs.
a3- Understand the method of patient assessment and care.
a4- Apply in practice setting the knowledge and understanding required to asses the pathogenesis, clinical features, management and treatment outcomes of some disorders

p- INTELLECTUAL SKILLS

b1- Differentiate the symptoms of different causing diseases.
b2- Identify the drug manufacturing relating problems and solve
b3-Apply in practice setting the knowledge and understanding required to meet the needs of patient and other health professionals
b3 Apply in practice setting the knowledge and understanding required to asses the pathogenesis, clinical features, management and treatment outcomes of some disorders

c-PROFESSIONAL AND PRACTICAL SKILLS

c1- Able to diagnose and treatment of some minor illnesses.
c2- Able to dispense the drug prescription.
C3- Able to manage the drug adverse effect or drug interaction.

d- GENERAL AND TRANSFERABLE SKILLS

d1 Interact effectively with patients, the public and health professionals.
d2- Reflect on the use of communication skills in counter prescribing.
d3-Critically analyze published literature

3- CONTENTS

TOPICS	No. of Lecture	No. of hours
The practice of community pharmacy • Definitions • Roles of community pharmacist	1	2
Non-prescription drugs: • Introduction • Types	1	2
• Community pharmacy organization • Structure of retail and wholesale drug store- • Types of drug stores and design • Legal requirements for establishment • Maintenance of drug store • Dispensing of proprietary products • Maintenance of records of retail and whole sale	2	4
1. Methods of patient assessment and care as they relate specifically to the drug and non-drug management of minor ailments, including o Infestations; ear, nose and throat conditions o Genitourinary tract infections o Skin disorders o Hemorrhoids'. o Insomnia o Allergy o Cough o Diarrhea o Constipation o Common cold	4	8
2. A review of pain management 3. Wound care 4. Immunization 5. Adverse drug reactions and drug interactions 6. As well as the pathogenesis, clinical features, management and treatment outcomes of major disorders of o Respiratory o Rheumatological o Neurological o Dermatological o Ocular diseases and disorders o Diabetes mellitus.	5	10
Total hours	26	13

4– Teaching and Learning Methods

4.1- Lectures
4.2- Tutorials
4.4- visiting to community pharmacies

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Mid term exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding

Assessment Schedule

Assessment 1 mid term exam	Week 6
Assessment 2 practical	week 12
Assessment 3 final exam	Week 14

Weighting of Assessments

Mid-Term Examination	30	%
Final-term Examination	70	%
Total	100	%

6- List of References

6.2- Essential Books (Text Books)

22. Handbook of Non-Prescription drugs

6.3- Recommended Books

Course Specification of Pharmacology IV

VII. Course Identification and General Information:

1.	**Course Title**	Pharmacology IV				
2.	**Course Number & Code:**					
3.	**Credit hours:**	**C.H**				**Total**
		Th.	**Pr.**	**Tr.**	**Seminar.**	
		2	**0**			**2**
4.	**Study level/ semester at which this course is offered:**	Fifth year / first semester				
5.	**Pre –requisite (if any):**	▪				
6.	**Co –requisite (if any):**	-				
7.	**Program (s) in which the course is offered:**	Bachelor of Pharmacy				
8.	**Language of teaching the course:**	English				
9.	**The department in which the course is offered:**	-				
10.	**Location of teaching the course:**					
11.	**Prepared by:**					
12.	**Date of approval:**					

VIII. Course description:

The course also deals with the study of pharmacodynamics and pharmacokinetics of drugs for endocrine glands disorders& drugs affecting central nervous system (CNS) and analgesic drugs.

IX. Intended learning outcomes (ILOs) of the course:

At the end of this course, the students will be able to:

1. Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & Drugs for endocrine glands disorders& drug posology of drugs affecting central nervous systems and analgesic drugs.
2. Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of Drugs for endocrine glands disorders and drugs affecting central nervous systems and analgesic drugs.
3. Comprehend his/her role as a pharmacist in providing correct information on rational use of

medications.

4. Classify drugs affecting central nervous systems and analgesics into various categories
5. Compare between therapeutically related drugs based on drug benefits (in particular efficacy and potency) and drug limitations.
6. Relate drug indications to MAO of drugs.
7. Predict drug limitations on the basis of Drug MOA.
8. Select an appropriate drug for patients based on drug benefits and limitation.
9. Calculate accurately drug's dosage, bioavailability, plasma half-life and volume of distribution in different patient populations.
10. Carry out appropriate techniques and measurements in experimental pharmacology.
11. Identify the common laboratory animals, laboratory equipment and conduct analytical procedures, appropriate to pharmacology, in a safe, accurate and precise used in experimental pharmacology.
12. Prepare critical, scientific and referenced reports
13. Share successfully in team-work.
14. Show respect to life.
15. Demonstrate time management and self-learning during performing practical and professional works and assignments.

X. 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-PILOs) in: Knowledge and Understanding		Course Intended Learning Outcomes (CILOs) in: Knowledge and Understanding	
After completing this program, students would be able to:		**After participating in the course, students would be able to:**	
A2-	Recognize the physicochemical properties, preparation, structure activity relationship (SAR), toxicity and the modern methods of analysis of various substances of chemical and natural products of therapeutic potential as well as the basic principle of drug discovery,	**a1-**	Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & Drugs for endocrine glands disorders& drug posology of drugs affecting central

	design and development.		nervous systems and analgesic drugs.
A3-	Describe the general cellular, biochemical and physiological aspects of human body and recognize the pharmacokinetics, pharmacodynamics, disease pathophysiology, and pharmacogenetic of therapeutic agents to provide pharmaceutical care and facilitate management of patient's medication, rationalize drug use andoverall health needs.	**a2-**	Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of Drugs for endocrine glands disorders and drugs affecting central nervous systems and analgesic drugs.
		a3-	Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment Learning Outcomes of Knowledge and Understanding to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Knowledge and Understanding **After participating in the course, students would be able to:**		**Teaching strategies/methods to be used**	**Methods of assessment**
a1-	Determine pharmacokinetics (absorption, distribution, metabolism and excretion) and drug benefits (therapeutic actions, indications, efficacy and potency) & Drugs for endocrine glands disorders& drug posology of drugs affecting central nervous systems and analgesic drugs.	Lectures methods , Computer based teaching and learning, group discussion and tutorial	Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam.
a2-	Discuss drug limitations (side effects, contraindications, precautions, use in special patent categories and drug interactions) of Drugs for endocrine glands disorders and drugs affecting central nervous systems and analgesic drugs.		
a3-	Comprehend his/her role as a pharmacist in providing correct information on rational use of medications.		

(B) Intellectual Skills:

Alignment Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Intellectual skills

Program Intended Learning Outcomes (Sub-PILOs) in Intellectual skills		Course Intended Learning Outcomes (CILOs) of Intellectual Skills	
After completing this program, students would be able to:		**After participating in the course, students would be able to:**	
B1-	Consolidate the chemical, biochemical and physiological principles to construct the pharmacophores of the structure and their effect on the stability,pharmacokinetic and pharmacodynamic profiles of the drug.	**b1-**	Classify drugs affecting central nervous systems and analgesics into various categories
		b2-	Compare between therapeutically related drugs based on drug benefits (in particular efficacy and potency) and drug limitations.
B2-	Categorize the synthetic and natural drugs according to their mechanism of action, systemic effect, therapeutic uses, contraindication and toxicity.	**b3-**	Relate drug indications to MAO of drugs.
		b4-	Predict drug limitations on the basis of Drug MOA.
B5-	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-**	Select an appropriate drug for patients based on drug benefits and limitation.

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*
b1-	Classify drugs affecting central nervous systems and analgesics into various categories	Lectures methods, Group Discussion, Problem solving sessions, brainstorming and Computer based teaching and learning	Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam.
b2-	Compare between therapeutically related drugs based on drug benefits (in particular efficacy and potency) and drug limitations.		
b3-	Relate drug indications to MAO of drugs.		
b4-	Predict drug limitations on the basis of drug MOA.		
b5-	Select an appropriate drug for patients based on drug benefits and limitation.		

(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 Practical Skills		Course Intended Learning Outcomes (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-	Operate different pharmaceutical equipments and instruments and use emerging technologies in design, synthesis, pre-formulation, formulation, packaging, storage and analysis of pharmaceutical products according to GLP, GSP and cGMP guidelines.	**c1-**	Calculate accurately drug's dosage, bioavailability, plasma half-life and volume of distribution in different patient populations.
		c2-	Carry out appropriate techniques and measurements in experimental pharmacology.
		c3-	Identify the common laboratory animals, laboratory equipment and conduct analytical procedures, appropriate to pharmacology, in a safe, accurate and precise used in experimental pharmacology.
C2-	Handle and dispose chemicals and pharmaceutical preparations including radiopharmaceuticals safely and effectively.	**c4-**	Prepare critical, scientific and referenced reports .
C5-	Conduct research studies and utilize the results in different pharmaceutical fields.		

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-	Calculate accurately drug's dosage, bioavailability, plasma half-life and volume of distribution in different patient populations.	Lectures methods, practical session, brainstorming and group discussion	Practical works, homework, practical exam and practical reports.
c2-	Carry out appropriate techniques and measurements in experimental pharmacology.		
c3-	Identify the common laboratory animals, laboratory equipment and conduct analytical procedures, appropriate to pharmacology, in a safe, accurate and precise used in experimental pharmacology.		

c4-	Prepare critical, scientific and referenced reports		

(D) General / Transferable Skills:

Alignment Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: General and Transferable skills

Program Intended Learning Outcomes (PILOs) in General / Transferable skills		Course Intended Learning Outcomes (CILOs) in General / Transferable skills	
After completing this program, students would be able to:		**After participating in the course, students would be able to:**	
D1-	Practice independent learning needed for continuous professional development	**d1-**	Share successfully in team-work.
D5-	Apply information and communication technology and working effectively in a team.	**d2-**	Show respect to life.
		d3-	Demonstrate time management and self-learning during performing practical and professional works and assignments.

Alignment Learning Outcomes of General and Transferable skills to Teaching and Assessment Methods.

Course Intended Learning Outcomes (CILOs) in General and Transferable Skills After participating in the course, students would be able to:		Teaching strategies/methods to be used.	Methods of assessment
d1-	Share successfully in team-work.	Small group discussions, Tutorials and Practical session	Homework and reports.
d2-	Show respect to life.		
d3-	Demonstrate time management and self-learning during performing practical and professional works and assignments.		

XI. Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1.	**Drugs for endocrine glands disorders (Hormones)**	a1, a2, a3, b1, b2, b3, b4, b5, d1, d2	Introduction to the Hormones in the body and expline how to work and illustration the Pharmacokinetics, Pharmacodynamics [drug	1	

			benefits : MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of sub topics of drugs for endocrine glands:		2
			Anterior and posterior pituitary hormones	1	2
			Antidiabetic drugs: insulin, oral hypoglycemics	1	2
			Drugs for thyroid gland disorders	1	2
			• Corticoteroids • Estrogens, progesterons, hormonal contraceptives and antiestrogens Androgens and antiandrogens	2	4
2.	**Midterm exam**	a1-3, b1-5		1	2
3.	**CNS drugs**	a1, a2, a3, b1, b2, b3, b4, b5, d1, d3	• Introduction to the chemical neurotransmitter in the central nervous system • Illustration the pharmacokinetics, pharmacodynamics [drug benefits: MOA, therapeutic action, indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of the sub topics of CNS	1	2
			General anaesthetics	1	2
			Local anesthetics	1	2
			Sedatives, hypnotics	2	4
			Antiepileptics	1	2
4.	**Analgesics**	a1, a2, a3, b1, b2, b3, b4, b5, d1-3	• Pharmacokinetics, Pharmacodynamics [drug benefits : MOA, therapeutic action,	2	4

			indications, efficacy and potency) and drug limitation (side effects, precautions, contraindications) and comparison of Analgesic Narcotic analgesics& opioids and hypnotics.		
5.	**Final Exam**	a1-3, b1-5		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

b - Practical Aspect

Order	Tasks/ Experiments	CILOs (symbols)	Number of Weeks	Contact Hours
1	Drugs for thyroid gland disorders in the rabbits animals	c1-c4, d1-d3	**2**	**4**
2.	Antidiabetic drugs: insulin, oral hypoglycemics in the rabbits animals	c1-c4, d1-d3	**2**	**4**
5	Study of phenobarbitone induced hypnosis (Demonstration)	c1-c4, d1-d3	**1**	**2**
6	Study of antidepressant property of drugs using pole-climbing apparatus.	c1-c4, d1-d3	**1**	**2**
7	Study of the anticonvulsant effect of phenytoin against maximal electroshock induced convulsion in mice	c1-c4, d1-d3	**1**	**2**
8	Mid-Exam	c1-c4, d1-d3	1	2
9	General anaesthetics test in the rats and mice animals	c1-c4, d1-d3	1	2
10	Study of the anticonvulsant property of diazepam on pentylenetetrazole induced convulsions in mice **Or**	c1-c4, d1-d3	1	2
11	Study of CNS stimulants and depressants using photoactometer	c1-c4, d1-d3	1	2
12	Study of the analgesic effect of morphine against acetic acid- induced writhing in mice.	c1-c4, d1-d3	1	2
13	Use of computer simulated CDs or Video cassettes for pharmacology practical whenever possible.	c1-c4, d1-d3	3	6
14	Final Exam	c1-c4	1	2
Number of Weeks /and Units Per Semester			**16**	**32**

XII. a-Teaching strategies of the course:

Lecture method, Group Discussion, Problem solving sessions and Computer based teaching and learning, tutorials, brainstorming and Practical sessions.
b- Assessment Methods:
Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam Practical works, practical exam and practical reports.

VII. Assignments:

No.	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Homework Assignments	**a1-3, b1-4, d1-2**	Sporadic through the semester	**10**
2	Reports	**c1-4, d1-3**		

I. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs symbols)
1.	**Attendance, Participation, reports and quizzes**	**All Weeks**	10	7%	a1-4,b1-4, d1-3
2.	**Quizzes and Homework-assignments**	Sporadic through the semester	10	7%	a1-4, b2-5, d1-3
3.	**Attendance, Practical Reports**	**All Weeks**	15	10%	c1-4
4.	**Practical mid-semester exam**	8th	15	10%	c1-4
5.	**Theoretical mid-semester exam**	7th	30	20%	a1, a2, a3, b1, b3
6.	**Final Exam (theoretical)**	**16th**	50	33%	a1-4, b1-5
7.	**Final Exam (practical)**	**16th**	20	13%	c1-4
	Total		**150**	**100%**	

II. Students' Support:

Office Hours/week	Other Procedures (if any)
Two contact hours per week	None

III. 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- Recommended Books and Reference Materials.

1. Richard A. Harvey. Lippincott's pharmacology, 2000, Lippincott William and Wilkins.
2. Udaykumar. Text book of medical pharmacology
3. Lectures Notes and Practical Manual.

3- Electronic Materials and Web Sites *etc*.

www.en.wikipedia.org/

IV. Facilities Required:

1 - Accommodation:	- Well-equipped lecture halls with data show facilities, whiteboards, net connection, etc. - Well-equipped laboratories with all required equipment and reagents.
3 - Computing resources:	- Computer laboratory with internet facilities.

V. Course Improvement Processes:

6- 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).

7- 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).

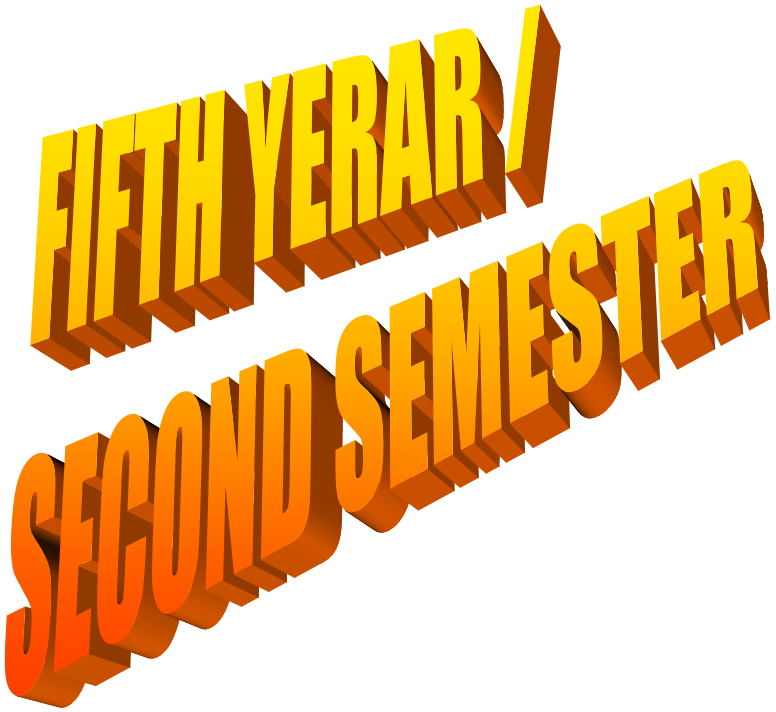
8- Processes for improvement of teaching.	
	▪ Revision of the course specification and its teaching strategies every three academic years after consideration of all issues raised by the teachers and/or students during regular meetings and discussions. ▪ Exploring any possible defects in the course that might be encountered by the teaching staff and their mitigation in subsequent improved versions of course specification.
9- 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.
10- Procedures for periodically reviewing of course effectiveness and planning for improvement	
	▪ Student rating and feedback ▪ Peer rating and feedback ▪ Regular meeting of the Curriculum Committee of the faculty.
6- Course development plans	
	▪ Conducting regular workshops for the staff for improving their course specification skills. ▪ Regular revision of course specification and syllabus items.

VIII. Course Policies: (including plagiarism, academic honesty, attendance etc)

The University Regulations on academic misconduct will be strictly enforced. Please refer to ----------

1	**Class Attendance:** ▪ 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.
2	**Tardy:** - 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.
3	**Exam Attendance/Punctuality:** ▪ Exam attendance is obligatory unless being excused by the department and faculty. ▪ Absence from assignments or exams will be dealt with according to the general policy of the university.

4	**Assignments & Projects:** ▪ Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator. ▪ Projects: Not applicable.
5	**Cheating:** ▪ Punishment of cheating will be according to the general policy of the university in this respect.
6	**Plagiarism:** ▪ 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.
7	**Other policies:** ▪ General policies of the Students' Affairs of the University and the Quality Assurance Unit.


FIFTH YERAR /
SECOND SEMESTER

Course specicification of Medicinal chemistry IV

Course Specifications

Programme(s) on which the course is given

Major or Minor element of programmes

Department offering the programme: -pharmaceutical chemistry

Department offering the course: - pharmaceutical chemistry

Academic year / Level fourth year /first semester

Date of specification approval

A- Basic Information

Title: Medicinal Chemistry II Code:
Credit Hours: 3hr Lecture: 2
Tutorial: Practical: 1 Total: 3

1 – OVERALL AIMS OF COURSE

1- To provide the knowledge of chemistry of drugs with special refrences to their pharmaceutical and medicinal usage.
2- To provide the knowledge about the relationship of chemical structure and therapeutic properties.
3- To correlate medical chemistry facts with manufactuer drugs & clinical application

2-INTENDED LEARNING OUTCOMES:

A- KNOWLEDGE & UNDERSTANDING:

a1-Understand the principles of medicinal chemistry.
a2- Describe the basic principles of mechanism action for active groups in pharmaceutics chemistry
a3-Explain the different reaction between active groups in pharmaceutics chemistry special in preparations of drugs
a3-Explain of nomenclature chemically of medical chemistry.

B- INTELLECTUAL SKILLS

b1- Apply preparation (synthesis) of medical compound drugs
b2- Identify the different of medical compound drugs by assay& titration
b3- Determine medically used & roles of important medical compound drugs.

C-PROFESSIONAL AND PRACTICAL SKILLS

c1- Maintain the name of chemical compound &derivatives or chemical modification effects.
c2- Classification of medical compound drugs according to medically used& active group.

d- GENERAL AND TRANSFERABLE SKILLS

d1. Work separately or in a team to research and prepare a scientific topic.

d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.

3- Content

NO	Topic	No .of hour	Lecture	Tutorial-practical
The following topics shall cover Nomenclature, classification, synthetic procedures of compounds mentioned under each category, structure activity relationship, mode of action and therapeutic use.				
	Anti-infective agents			
	❑ Alcohols, phenols, oxidizing agents,			
	iodine, chlorine comp, cationic surfactants			
	, dyes, mercury comp, preservatives.			
	❑ **Antifungal agents:**			
	Azoles, allylamines, fatty acids, phenols,			
	nucleosides, polyenes, others.			
	❑ **Synthetic antibacterial agents:**			
	▫ Quinolones, nitrofurans, methenamine,			
	▫ urinary analgesics.			
	▫ Antitubercular agents			
	▫ Antiprotozoal agents			
	▫ Anthelminthics			
	▫ Antiscabious and antipedicular agents			
	Sulfonamides			
	Antimalarials			
	Antibiotics	2	1	2
	❑ β-lactams, aminoglycosides, tetracyclines			
	❑ macrolides, lincomycins, polypeptides.			
	Antiviral agents			
	: Antineoplastic agents:			
	❑ Alkylating agents, antimetabolites,			
	❑ antibiotics, plant products, hormones,			
	❑ immunotherapy, micellaneous.			
	Diagnostic agents			
Total hours		26	13	11

4– Teaching and Learning Methods

4.1- Lectures
4.2- Tutorials
4.3- Practical
4.4- visiting to pharmaceutical industry companies.

5- Student Assessment Methods

5.1- Participation& semester work to assess intellectual skills
5.2- Mid term exam to assess the knowledge & understanding

5.3-Final term exam	to assess the knowledge & understanding
5.4- Practical exam	to assess the practical skills.

Assessment Schedule

Assessment 1 mid term exam	Week 6
Assessment 2 practical	week 12
Assessment 3 final exam	Week 14

Weighing of Assessments

Mid-Term Examination	20	%
Final-term Examination	60	%
Practical Examination	20	%
Total	100	%

***- List of References**

7. Wilso; Gisvold, Doerge, Text book of organic medical pharmaceutical chemistry 7th edition –J . B. Lippincot.
8. Remington's pharmaceutical sciences,

Course specification of Industrial pharmacy II

COURSE SPECIFICATIONS:

- Programme (s) on which the course is given:
- Major or Minor element of programmes:
-Department offering the programmes:
-Department offering the course:

Academic year \ level: -4th year /2nd semester

Date of specification approval: -

BASIC INFORMATION:

Title: Industrial pharmacyII Code:
Credit Hours: 2 Lecture:
Tutorial: 2 Practical: Total:

PROFESSIONAL INFORMATION

1-AIMS OF THE COURSE:

1. To provide a basic specialised knowledge in the areas of analytical techniques, research and development, production and quality assurance with reference to industrial pharmacy
2. Explore in detail the types of equipments &instruments used in the preparation, separation, extraction & sterilization.
3. Carryout a good manufacturing practice.
5. Develop the basic scientific research skills as well as effective communication and team work attitudes.

2-INTENDED LEARNING OUTCOMES:

a-KNOWLEDGE and UNDERSTANDING:

a1. Describe the steps of manufacturing of injections, tablets, capsules &drops.
a2. Describe & explain the methods of drug separations.
a3. Describe & explain all the lines of drugs industry.

b-INTELLECTUAL SKILLS:

b1. Interpret the most important unwanted drug changed that may occur after preparation e.g.: contamination, separation…
b2. Integrate industrial pharmacy with other pharmacy sciences e.g. pharmaceutics, medicinal chemistry.

c-PRACTICAL SKILLS:

c1. Perform the most important separations tests: evaporation, filtration, crystallization, &extraction.

d-GENERAL SKILLS AND ATTITUDES:

d1. Work separately or in a team to research and prepare a scientific topic.
d2. Present clearly and effectively scientific topic in a tutorial, a staff meeting or the yearly scientific day.
d3. Present industrial data in a graphical form.

3-COURSE CONTENTS:

Topic	No. of hours	Lecture
1. Granulation.	1	2
2. Pharmaceutical powder compaction technology	1	2
3. Force displacement and network measurements	1	2
4. Characterization of packing geometry and Consolidation mechanisms of powder	1	2
5. Porosity-pressure functions Porosity-pressure equations.	1	2
6. (Tablet Coating.	1	2
7. Sustained Release Tablets.	1	2
8. (Factors affecting the release of the drug from a tablet.	1	2
9. Quality control of Compressed Tablets.	1	2
10. Encapsulation.	1	2
11. Materials of fabrication and corrosion.	1	2
12.Microbiology and industrial pharmacy.	1	2
13. Current Good Manufacturing Practice (c.G.M.P).	1	2
TOTAL	**15**	**30**

Teaching and Learning Methods:

1- Lectures.
2- Discussion.
3- Visiting of pharmaceutical industries

Student Assessment Methods:

5.1- Participation& semester work to assess intellectual skills
5.2- Mid term exam to assess the knowledge & understanding
5.3-Final term exam to assess the knowledge & understanding

Assessment schedule:

Assessment 1- Semester work	weak	4
Assessment 2- Mid term exam.	weak	8
Assessment 3- Final term exam.	weak	18

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Weighting of Assessments

-Semester work	10%
-Mid term exam	20%
-Final term exam	70%
Total	100%

List of References:

1. Theory and Practice of Industrial Pharmacy-Lachman,Lieberman and Kanig
2. Bentley's Text Book of Pharmaceutics - Rowlin.
3. Tutorial Pharmacy - Cooper and Gunn.
4. An introduction to Chemical Engineering - Badger and Banchero.

Course specification of Clinical Pharmacy II

Department offering the programme**:- Pharmaceutics**

Department offering the course**:- pharmaceutics**

Academic year / Level: Fourth **year** /2nd semester.

A- Basic Information

Title: Clinical Pharmacy Code:
Credit Hours: 2 Lecture: 2
Tutorial: Practical:0 Total: 2

B- Professional Information

1 – Overall Aims of Course

6. Giving knowledge about the diagnosis of disease.
7. Analysis the all information about patient's state according the patient history, clinical features and laboratory findings.
8. Solve the given case according to the correct therapeutic way.
9. Detect the complications of the diseases.
10. Recognize the safety of drugs in special groups like children, elderly and pregnancy..

2 – Intended Learning Outcomes of Course (ILOs)

q- Knowledge and Understanding:

a1- Define the Epidemology,Etiology,Risk factors for particular condition under study.
a2- Recognize the Clinical features & laboratory tests for each case study .
a3- Mention the therapeutic approaches, both pharmacological and non-pharmacological in details .
a4- Identify Mechanism of these drugs.
a5- Explain the reasons of clinical complications &drug interaction .
a6-Understand the principals of human anatomy, histology, pathology and physiology that relevant to clinical pharmacokinetic of drugs.
a7-To acquire knowledge about drugs and their uses therapeutically concerning their identities, safety, optimum use in medication and contraindications.
a8- Knowledge about the correct diagnosis of diseases.
a9-Recognition of disease state, pathology and management of symptoms.
a10-To get knowledge about recent researches, articles and advanced studies on drugs treating many diseases

b- Intellectual Skills

b1- list precaution to be taken for each prescribed drugs individually or in combination.
b2 -Explain how to deal with patient when side effect occurred.
b3-The student can diagnosed disease according to their manifestations, investigations and physical examinations
b4-Interpret the clinical features and the diseases related to them.

b5-Solve the case studies according to the therapeutic way.
b6-Interpret patient and clinical data, including patient records held within practice settings.

d- Professional and Practical Skills

c1-Acquire skills to diagnosed the case studies precisely.
c2-Evaluate critically observations and measurements, in terms of their significance and theory underlying them.
c3-Give advises for the patients and others on the safe and effective use of medicines
c4- Acquire the skill of drug monitoring therapy.

d-General and Transferable Skills

d1-Improve the communications with the patients or physicians.
d1-Apply principles of human needs.
d2- Great a management plan for drugs administration..
d3- Evaluate a management plan for drugs administration.
d4-Interact effectively with patients, the public and health care professionals; including communication both written and oral.
d5-Solve the problem base relating to given information like patient history.
d6-Writing a report for criticizing of suitable drugs for each case
d7-Behave with an ethical attitude and approach.

3- Contents

Topic	No. of hours	Lect	Tutorial/Practical
• Providing instructions and supervised clinical experience. • Training emphasizes effective monitoring of drug therapy, preventing, detection and correcting drug related problems, and managing and optimizing drug therapy. • In-patient services including therapeutic drug monitoring utilizing clinical pharmacokinetic tools and knowledge, • Consultations, communication with other members of the health care team as well as with patients. • Drug histories and discharge consultation are required as well as attending rounds with medical teams in o general medicine o pediatrics o and / or general surgery. • Role drug information center			

4– Teaching and Learning Methods

4.1- Lectures, Discussion.
4.2- Group discussion.
4.3- visiting hospital to take patient history and medication profile.

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Mid term exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding
5.4- Practical exam	to assess the practical skills.

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Assessment Schedule

Assessment 1 **Formative assessment**.	Week **(2)**
Assessment 2 **Mid-Term Examination**	Week **(6)**
Assessment 3 **Formative assessment**.	Week **(9)**
Assessment 4 **Final written exam**.	Week **(12)**

Weighting of Assessments

Mid-Term Examination	20 %	
Final-term Examination	60 %	
Practical and Semester Work	20 %	
Total		100%

6- List of References

6.1- Course Notes

Handout Texts

6.2- Essential Books (Text Books)

3. Walker and Edwards (eds). Clinical Pharmacy and Therapeutics Third edition (2003).
4. Applied Therapeutics: The Clinical Use of Ddrugs. Koda-kimble.

6.3- Recommended Books

3. Walker and Edwards (eds). Clinical Pharmacy and Therapeutics Third edition (2003).
4. Applied Therapeutics: The Clinical Use of Drugs. Koda-kimble.

7- Facilities Required for Teaching and Learning

- White board & Markers.
- Over head projector.
- Data show

Course specicification of graduate research project

Course Specifications

Programme(s) on which the course is given

Major or Minor element of programmes

Department offering the programme: - pharmacy

Department offering the course: -

Academic year / Level: fifth year (first/second)

A- Basic Information

Title: Graduation Project & Comprehensive Examination **Code:**
Credit Hours: 2 hr **Lecture:**
Tutorial: **Practical:** **Total:**

B- Professional Information

1 – OVERALL AIMS OF COURSE

1. Each student carries out a project relevant to current pharmaceutical development and practice in the hospital, community and pharmaceutical industry and/or research laboratory, and writes a critical report of relevant knowledge, novel observations and findings.
2. To apply research skills into a research study, undertake fieldwork and present a dissertation.

2-INTENDED LEARNING OUT COMES:

a- KNOWLEDGE & UNDERSTANDING:

a1-Understand the Principles of research planning and design
a2- Describe principles of basics of experimental design and analysis.

b- INTELLECTUAL SKILLS

b1- Identify suitable research topics.
b2- Undertake independent research.
b3- Critical review and analysis of related literature.

c-PROFESSIONAL AND PRACTICAL SKILLS

c1- Design research study
c2- Perform method validation and presentation of research report.
C3-Writing the research proposal and theses.

d- GENERAL AND TRANSFERABLE SKILLS

d1-Demonstrate appropriate communication skills.
d2- Present the research data.

3- Content

Topic	No .of hour	Lecture	Tutorial-practical
• Development of a research protocol • Fieldwork and data analysis • Publishing of articles and preparation of reports			
• This research project course involves the generation of new scientific information and a review and understanding of the pertinent scientific literature. • The research may be conducted in a laboratory, hospital, community pharmacy, pharmaceutical company, etc., depending on the project and the supervisor. • Students are expected to work approximately 78 hours. This will include working in the laboratory, etc., reading or searching literature, and writing up the research project. • Fields of study available may include: o Medicinal chemistry o Pharmaceutics o pharmacokinetics o Drug metabolism o Pharmacology o Toxicology.			
Total hours			

4– Teaching and Learning Methods

4.1- research
4.2- Tutorials

5- Student Assessment Methods

1- Dissertation
2- A final comprehensive examination in pharmaceutics and pharmacology

Assessment Schedule

At the end of the semester week 15

For dissertation evaluation

Evaluation of student performance is as follows:

	Components	Grade distribution	
		Supervisor	Reviewer
1	Identification of problem	5	3
2	Hypotheses testing design	5	2
3	Quality of methodologies	5	2

4	Quality of work (carefulness)	10	5
5	Originality and creativity	5	3
6	Data analysis	10	5
7	Critical evaluation	10	5
8	Write-up (style, grammar)	20	5
Total hours		70	3
		100	

Course specification of Hospital pharmacy practice

Course Specifications

Programme(s) on which the course is given

Major or Minor element of programmes

Department offering the programme: - pharmacy

Department offering the course: - Pharmaceutics

Academic year / Level 5th year / 2nd semester

Date of specification approval

A- Basic Information

Title: hospital pharmacy practice **Code:**
Credit Hours: 2 hr **Lecture: 2**
Tutorial: **Practical:** **Total: 2**

B- Professional Information

1 – OVERALL AIMS OF COURSE

1. 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.
2. The resident shall also develop an understanding of an intravenous admixture service, including total parenteral nutrition and chemotherapy
3. To provide student with a detailed knowledge and understanding concerning the responsibilities of a hospital pharmacist.

2 – INTENDED LEARNING OUTCOMES OF COURSE (ILOS)

r- KNOWLEDGE AND UNDERSTANDING:

a1-Explain hospital organization/committee functions, interpret and enter patient orders and prepare intravenous admixtures.
a2-Describe and demonstrate the steps involved in preparation of intermittent and continuous infusions, total parenteral nutrition, and chemotherapy.
a3-Understand steps involved in drug therapy monitoring
demonstrate proper aseptic technique in IV admixture compounding
a4-Demonstrate appropriate and accurate use of calculations in all aspects of intravenous admixture preparation
a5-Describe all legal requirements and professional standards that pertain to the distribution and control of drugs in hospitals.
a6-Demonstrate evidence of understanding of policies and procedures relating to distribution and administration of drugs to patients.
a7-Explain the principles, advantages and disadvantages of the various types of drug distribution systems used in hospitals and their contribution to patient- focused pharmacy practice.

a8-Describe the role of drug distribution as a component of the provision of pharmaceutical care.
a9- State the benefits and limitations of using a profile for pharmacotherapy monitoring and drug distribution.
a10-Explain the process of adverse drug reaction reporting and analysis.

s- INTELLECTUAL SKILLS

b1- Calculate the medicine doses and dosage regimen.
b2-Interpret patient and clinical data, including patients records held within practice settings.
b3-Interpret of prescription and other orders of medicines.
b4-Identify potential drug- related problems that could occur as result of the hospital's distribution system and identify ways to prevent their occurrence.
b5-Apply in practice setting the knowledge and understanding required to meet the needs of patient and other health professionals.
b6-Interpret the appropriateness of medication order before preparing or permitting dispensing the patient dose.
b7-Apply pharmacoeconomic and formulary management principles to achieve cost effective outcomes for patients of institutions or health-systems.
b8-Recognize/ correct dosage calculation problems
b9-Identify potential drug-related problems that could occur as a result of the hospital's distribution system and identify ways to prevent their occurrence.

t- PROFESSIONAL AND PRACTICAL SKILLS

c1- Design and evaluate therapeutic regimens to optimize drug use.
c2-Interpret and process of medical orders.
c3-Dispense medicines, advice patients on correct and rational use of medicines and cosmetics.
c4-Interpret patient scientific data to help evaluate and optimizing prescribing in primary care.
c5- Counsel people on health matters
c6-Apply their knowledge to advice patients and other health care professionals about safe and effective use of drugs and medicines**.**
c7-Unit dose Interpret/ check medication orders for completeness, appropriateness, and accuracy
c8-Evaluate medication orders for drug allergy, interactions, and contraindications according to specific patient profiles
c9-Identify real or potential drug-related problems through the use of medication profiles and initiate appropriate action.
c10- Follow departmental procedures and pharmacy standards of practice to insure the integrity of drugs dispensed within the hospital.
c11-Identify, document, evaluate and follow-up on medication errors, in accordance with hospital policy.
c12- Effectively review, process and dispenses medication orders, according to hospital policies and procedures, including formulary drugs, non-formulary drugs,

restricted drugs, drugs within therapeutic interchange policy, investigational and special access drugs, narcotic and controlled drugs.
c13- Label and document dispensing of all drugs, in accordance with the hospital's policies and procedures.
c14-Accurately assess admixture solutions for appropriate concentrations, rate, compatibilities, stability, and storage

u- GENERAL AND TRANSFERABLE SKILLS

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.

3- CONTENTS

Topic	No. of hours	Lecture
Introduction • Organization and Structure Organization of a hospital and hospital pharmacy • Responsibilities of a hospital pharmacist • Pharmacy and therapeutic committee • Hospital formulary Contents, preparation and revision of hospital formulary.	4	2
Drug Store Management and Inventory Control: • Organization of a drug store • Types of materials stocked • Storage conditions	4	2

Inpatient pharmacy services
• Dose adjustment.
• Intravenous admixture (TPN).
  • Understand the basic principles of aseptic technique, as well as policies and procedures for parenteral drug administration
  • Practice the appropriate aseptic technique used in the preparation of intravenous admixtures (liquid-liquid transfer, powder reconstitution, ampule transfer…)
  • Perform all calculations associated in all aspects of intravenous admixture preparation appropriately and accurately
  • Use information resources to locate and provide information on, or solve problems related to incompatibilities, drug stabilities, rates and routes of administration…
• Therapy drug monitoring (TDM)
• Unit dose Interpret/ check medication orders for completeness, appropriateness, and accuracy;
• Evaluation of medication orders for drug allergy, interactions, and contraindications according to specific patient profiles
• Correct dosage calculation problems
• Process of adverse drug reaction reporting and analysis.
Outpatient pharmacy services
	4	2

Drug Distribution Systems in Hospitals: • Outpatient dispensing - methods adopted. • Dispensing of drugs to inpatients. • Types of drug distribution systems. • Charging policy – labeling • Dispensing of drugs to ambulatory patients. • Dispensing of controlled drugs.	4	2
Central Sterile Supply Unit and its Management • Types of materials for sterilization • Packing of materials prior to sterilization • Sterilization equipments • Supply of sterile materials	2	1
Manufacture of Sterile and Non-sterile Products • Policy making on manufacturable items • Demand and costing – • Master formula Card, • Production control, • Manufacturing records.	2	1
Drug Information Service Sources Information on drugs, disease, • Treatment schedules • Procurement of informations • Computerized services (e.g. MEDLINE) • Computer systems for prescription filing • Drug profile • Patient medication profile • Cases on drug interaction and adverse reactions, radiosynchrotic cases, etc. • Retrieval of informations • Medication error	4	2
• Pharmaceutical services o Quality control o Clinical pharmacokinetics. o Drug investigation • Educational activities. • Clinical trials and good clinical research practice.	2	2
Total hours	26	13

4– Teaching and Learning Methods

4.1- Lectures
4.2- Tutorials
4.4- visiting to hospitals.

5- Student Assessment Methods

5.1- Participation& semester work	to assess intellectual skills
5.2- Mid term exam	to assess the knowledge & understanding
5.3-Final term exam	to assess the knowledge & understanding

Assessment Schedule

Assessment 1 mid term exam	Week 6
Assessment 2 practical	week 12
Assessment 3 final exam	Week 14

Weighting of Assessments

Mid-Term Examination	30	%
Final-term Examination	70	%
Total	100	%

6- List of References

6.1- Course Notes

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6.2- Essential Books (Text Books)

1. Remington's Pharmaceutical Sciences, A.R.Gennaro Ed. 18th ed. Mack Publishing Co. Pennsylvania, USA 1990.
2. M. C. Allwood and J. T. Fell "Textbook of Hospital Pharmacy" Blackwell Scientific Publications, Oxford 1980.
3. W.E. Hassan "Hospital Pharmacy" 3rd ed. Lea and Febiger, Philadelphia,1974.
4. Clinical Pharmacy - Jankins, Superandio and Laticlasis.

Course Specification of Pharmaceutical Marketing

XIII. Course Identification and General Information:							
1	Course Title:	Pharmaceutical Marketing					
2	Course Number & Code:						
3	Credit hours: 2hrs	C.H				Total	
		Theoretical	Practical	Training	Seminar		
		2				2	
4	Study level/ semester at which this course is offered:	5th level / second semester					
5	Pre –requisite (if any):	-					
6	Co –requisite (if any):						
7	Program (s) in which the course is offered:	Bachelor of Pharmacy					
8	Language of teaching the course:	English					
9	The department in which the course is offered:						
10	Location of teaching the course:						
11	Prepared by:						
21	Date of approval:						

XIV. Course description:

Understand the fundamental aspects of marketing and promotional activities in the healthcare sector. -Point out the relationship between marketing and finance. -Understand the fundamental aspects of pharmacy management. -Develop good selling and negotiation skills.

XV. Intended learning outcomes (ILOs) of the course:

At the end of this course, the students will be able to:

1. Learn the importance of pharmaceutical marketing in business
2. Know the importance of promotional activities in healthcare.
3. Identify different types of pharmaceutical marketing analysis
4. Describe the balance sheet and operating income management.
5. Report different types of marketing analysis.
6. Illustrate market needs.
7. Recognize and control pharmacy business.
8. Manage the relationship with customers
9. Handle of balance sheet and operating income management
10. Analyze product life cycle
11. Assess Marketing plan and planning.

12. Assess Stock management skills.
13. Employ good selling and negotiation skills.
14. Retrieve curriculum vitae.
15. Develop good relationships with the customers.
16. Arrange Presentation and interviewing skills.

XVI. Intended learning outcomes (ILOs) of the course:

(A) Knowledge and Understanding:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Knowledge and Understanding.

Program Intended Learning Outcomes (Sub- PILOs) in: Knowledge and Understanding		Course Intended Learning Outcomes (CILOs) in: Knowledge and Understanding	
After completing this program, students will be able to:		**After completing this course, students will be able to:**	
A4-	Recognize the pharmaceutical dosage form design and the quality control of pharmaceutical formulations according to GMP and pharmacopeial requirements to support the pharmaceutical industries and research.	**a1-**	Learn the importance of pharmaceutical marketing in business
A5-	Demonstrate the basic knowledge of pharmacoecnomics, pharmacovigilence, policy, legislation, marketing, administration and distribution of pharmaceutical and cosmetic products as well as ethics of health care..	**a2-**	Know the importance of promotional activities in healthcare.
		a3-	Identify different types of pharmaceutical marketing analysis
		a4-	Describe the balance sheet and operating income management.
		a5-	Report different types of marketing analysis.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Knowledge and Understanding to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Knowledge and Understanding		Teaching strategies/methods to be used	Methods of assessment
completing this course, students will be able to:		▪ Lectures brainstorming and discussion	▪ Attendance ▪ Written and oral exams ▪ Quiz and Small Projects
a1-	Learn the importance of pharmaceutical marketing in business		
a2-	Know the importance of promotional activities in healthcare.		
a3-	Identify different types of pharmaceutical marketing analysis		
a4-	Describe the balance sheet and operating income management.		
a5-	Report different types of marketing analysis.		

(B) Intellectual Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Intellectual skills

Program Intended Learning Outcomes (Sub- PILOs) in	Course Intended Learning Outcomes (CILOs) of Intellectual

Intellectual skills		Skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
B1	Consolidate the chemical, biochemical and physiological principles to construct the pharmacophores of the structure and their effect on the stability, pharmacokinetic and pharmacodynamic profiles of the drug.	**b1-**	Illustrate market needs.
B3	Design different types of safe and effective pharmaceutical dosage forms and develop novel methods of analysis for pharmaceutical and biopharmaceutical products that support pharmaceutical research	**b2-**	Recognize and control pharmacy business.
B5	Plan a modern system for administration of medical foundations and merge the ethics to business during the drug marketing	**b3-**	Manage the relationship with customers.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Intellectual Skills to Teaching Methods and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Intellectual Skills.		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		Lectures, discussion and brain storm	Written , report and oral exams
b1-	Illustrate market needs.		
b2-	Recognize and control pharmacy business.		
b3-	Manage the relationship with customers.		

(C) Professional and Practical Skills:

Alignment of 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 Practical Skills		Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
C1-	Operate different pharmaceutical equipments and instruments and use emerging technologies in pre-formulation, formulation, packaging, storage and analysis of pharmaceutical products according to GLP, GSP and cGMP guidelines.	c1-	Handle of balance sheet and operating income management
C5-	Conduct research studies and utilize the results in different pharmaceutical fields.	c2-	Analyze product life cycle
		c3-	Assess Marketing plan and planning.
		c4-	Assess Stock management skills.
		c5-	Employ good selling and negotiation skills.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Professional and Practical Skills to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		- Lectures, discussion and brain storm	- Written and oral exams
c1	Handle of balance sheet and operating income management		
c2	Analyze product life cycle		
c3	Assess Marketing plan and planning.		
c4	Assess Stock management skills.		
c5	Employ good selling and negotiation skills.		

(D) General / Transferable Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: General and Transferable skills

Program Intended Learning Outcomes (PILOs) in General / Transferable skills		Course Intended Learning Outcomes (CILOs) in General / Transferable skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
D2-	Employ proper documentation and filing systems in different pharmaceutical fields	d1-	Retrieve curriculum vitae.
D3-	Develop financial, market management, writing, presentation and time management skills as well as creativity, critical thinking, problem solving and decision making abilities.	d2	Develop good relationships with the customers.
D4-	Take responsibility for adaptation to change needs in pharmacy practice.	d3	Arrange Presentation and interviewing skills.
D5-	Apply information and communication technology		

	and working effectively in a team		

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of 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 completing this course, students will be able to:		Lectures and discussion	Reports, project, Written and oral exams
d1-	Retrieve curriculum vitae.		
d2	Develop good relationships with the customers.		
d3	Arrange Presentation and interviewing skills.		

XVII. Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1	Introduction to pharmaceutical marketing	**a1, b1**	Methods of Economic Evaluation	**1**	**2**
2	Marketing definition and importance	**a3, b1,a2**	The professional sales person	**1**	**2**
3	pharmaceutical Marketing promotional mix and promotional activities in the	**a2**	Communication	**1**	**2**
4	Element of pharmaceutical marketing plan and planning	**b1, c3**	Marketing Plain and Marketing Mix	**1**	**2**
5	pharmaceutical Marketing analysis	**a3, a5**	Selling	**1**	**2**
6	Management of product life cycle	**c2**	Definitions, classifications	**1**	**2**
7	Mid-term exam	**a1-5, b1, c2-3**		**1**	**2**
8	Finance and accounting – relationship between marketing and finance	**b1, b2**	Electronic Information Management	**1**	**2**
9	Managing profitability of business/brand	**b2**	Definitions, classifications	**1**	**2**
10	Balance sheet and operating income management	**a4, c1**	Definitions, classifications	**1**	**2**
11	Pharmacy management- category management	**c2, c5**	Definitions, classifications	**1**	**2**

12	Merchandizing and stock management	**b2, c4**	Definitions, classifications	**1**	**2**
13	Skills development- selling and negotiation skills	**b3, c5,d2,d3**	Definitions, classifications	**1**	**2**
14	Interviewing skills	**b3, b2, b3**	Applications	**1**	**2**
15	Writing Curriculum Vitae	**d1**	Professional Writing	**1**	**2**
16	Final-term exam	**a1-5, b1-3, c1-5**		**1**	**2**
Number of Weeks /and Units Per Semester				**16**	**32**

XVIII. a- Teaching strategies of the course:

Lecture method, Group Discussion, Problem solving sessions**,** tutorials and brainstorming.

b-Assessment Methods:

Oral Exam, Quizzes, Attendance, Participation, Short answers, reports, project, and Written exam

VII. Assignments:

No.	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Homework Assignments	**a1-5, b1-3, d1-3**	Sporadic through the semester	**10**
2	Reports	**c1-5, d1-3**		

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs symbols)
1	Quizzes, Attendance, Participation, reports	All weeks	**10**	10%	**a1-5, b2-3, c1, c4-5,d1-3**
2	Written Mid exam, Oral exam, reports, projects	2-14	**30**	30%	**a1-5, b1, c2-3**
3	Written Final exam	16th	**60**	60%	**a1-5, b1-3, c1-5**
	Total		**100**	**100%**	

IX. Students' Support:

Office Hours/week	Other Procedures (if any)
2hrs/week	

X. Learning Resource (MLA style or APA style)s:

5- Required Textbook(s) (maximum two)

A book prepared by the staff members

Mickey C. Smith., 1991, Pharmaceutical Marketing: Strategy and cases. Haworth Press Inc .

6- Recommended Readings and Reference Materials

oyd, V Allen J.,2013, Remington: The Science and Practice of Pharmacy 22nd edition, Pharmaceutical Press, :. London.

Kotler, Philip, and Gary Armstrong., 2010, Principles of marketing. Pearson Education,.

7- Electronic Materials and Web Sites *etc*.

www.pubmed.com
http://www.sciencedirect.com
http://www.wikipedia.com
https://scholar.google.com.eg/

8- Other Learning Material:

J. Pharm. Sci
Published articles related to the discussed topics

XI. Facilities Required:

1 - Accommodation:	- Well-equipped lecture halls with data show facilities, whiteboards, net connection, etc. - Well-equipped laboratories with all required equipment and reagents.
4 - Computing resources:	- Computer laboratory with internet facilities.

XII. Course Improvement Processes:

11- 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).

12- 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).
13- 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 be encountered by the teaching staff and their mitigation in subsequent improved versions of course specification.
14- 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.
15- Procedures for periodically reviewing of course effectiveness and planning for improvement	
	▪ Student rating and feedback ▪ Peer rating and feedback ▪ Regular meeting of the Curriculum Committee of the faculty.
6- Course development plans	
	▪ Conducting regular workshops for the staff for improving their course specification skills. ▪ Regular revision of course specification and syllabus items.

XIII. Course Policies: (including plagiarism, academic honesty, attendance etc)

The University Regulations on academic misconduct will be strictly enforced. Please refer to ----------

1	**Class Attendance:** ▪ 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.
2	**Tardy:** - 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.
3	**Exam Attendance/Punctuality:** ▪ Exam attendance is obligatory unless being excused by the department and faculty.

	▪ Absence from assignments or exams will be dealt with according to the general policy of the university.
4	**Assignments & Projects:** ▪ Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator. ▪ Projects: Not applicable.
5	**Cheating:** ▪ Punishment of cheating will be according to the general policy of the university in this respect.
6	**Plagiarism:** ▪ 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.
7	**Other policies:** ▪ General policies of the Students' Affairs of the University and the Quality Assurance Unit.

Course Specification of Drug design

XIX. Course Identification and General Information:

1.	**Course Title**	Drug design				
2.	**Course Number & Code:**					
3.	**Credit hours:**	**C.H**				**Total**
		Th.	**Pr.**	**Tr.**	**Seminar.**	
		2				2
4.	**Study level/ semester at which this course is offered:**	5^{th} level / 2^{nd} semester				
5.	**Pre –requisite (if any):**	Medicinal Chemistry I,II, III & IV				
6.	**Co –requisite (if any):**	-				
7.	**Program (s) in which the course is offered:**	**Bachelor of pharmacy**				
8.	**Language of teaching the course:**	English				
9.	**The department in which the course is offered:**					
10.	**Location of teaching the course:**					
11.	**Prepared by:**					
12.	**Date of approval:**					

XX. Course description:

This course introduces students to the basic principle of drug discovery and development. It demonstrate properties of drug likeness and drugs. It also covers the fundamental knowledge about the drug design.

XXI. Intended learning outcomes (ILOs) of the course:

At the end of this course, the students will be able to:

1. Recognize the basic principles of drug discovery, design and development.
2. Illustrate the concepts of fragments, drug likeness and drugs properties and importance of combinatory and parallel synthesis in finding a drug likeness.
3. Discuss the basic concepts of drug targets.
4. Demonstrate the essential knowledge and understanding about the properties of drug likeness in designing new chemical entities of potential biological activities.
5. Explain the preclinical and clinical studies that proceed the getting drug to the market.
6. Determine the methods used to calculate the properties of drug molecules
7. Identify the 3D pharmacophore of drug and the binding sites
8. Diagram the schemes that describe the types drug designs

9. Apply the docking procedures for design of some enzyme inhibitors.
10. Practice the drug design using some computer program.
11. Work independently or collaboratively as a teamwork member to prepare seminars/ presentations or write reports to present some examples for drug design.
12. Use computer and technology efficiently to collect, analyze and interpret information to gain knowledge in field of drug discovery and design.

XXII. 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-PILOs) in: Knowledge and Understanding		Course Intended Learning Outcomes (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-	Recognize the principles of physical, chemical, clinical, social, behavioral, health and pharmaceutical sciences.	**a1-**	Recognize the basic principles of drug discovery, design and development.
A2-	Recognize the physicochemical properties, preparation, structure activity relationship (SAR), toxicity and the modern methods of analysis of various substances of chemical and natural products of therapeutic potential as well as the basic principle of drug discovery, design and development.	**a2-**	Illustrate the concepts of fragments, drug likeness and drugs properties and importance of combinatory and parallel synthesis in finding a drug likeness.
		a3-	Discuss the basic concepts of drug targets.
A3-	Understand the general cellular, biochemical and physiological aspects of human body and recognize thepharmacokinetics, pharmacodynamics, disease pathophysiology, and pharmacogenetic of therapeutic agents to provide pharmaceutical care and facilitate management of patient's medication, rationalize drug use andoverall health needs.	**a4-**	Demonstrate the essential knowledge and understanding about the properties of drug likeness in designing new chemical entities of potential biological activities.
		a5-	Explain the preclinical and clinical studies that proceed the getting drug to the market.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment Learning Outcomes of Knowledge and Understanding to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Knowledge and Understanding After participating in the course, students would be able to:		Teaching strategies/methods to be used	Methods of assessment
a1-	Recognize the basic principles of drug discovery, design and development.	Lectures methods, group discussion, Computer	Quizzes, Attendance, Participation, reports,

a2-	Illustrate the concepts of fragments, drug likeness and drugs properties and importance of combinatory and parallel synthesis in finding a drug likeness.	based teaching and learning.	homework, and written exam.
a3-	Discuss the basic concepts of drug targets.		
a4-	Demonstrate the essential knowledge and understanding about the properties of drug likeness in designing new chemical entities of potential biological activities.		
a5-	Explain the preclinical and clinical studies that proceed the getting drug to the market.		

(B) Intellectual Skills:

Alignment Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Intellectual skills

Program Intended Learning Outcomes (Sub-PILOs) in Intellectual skills		**Course Intended Learning Outcomes (CILOs) of Intellectual Skills**	
After completing this program, students would be able to:		**After participating in the course, students would be able to:**	
B1-	Consolidate the chemical, biochemical and physiological principles to construct the pharmacophores of the structure and their effect on the stability, pharmacokinetic and pharmacodynamic profiles of the drug.	**b1-**	Determine the methods used to calculate the properties of drug molecules.
		b2-	Identify the 3D pharmacophores of drugs and the binding sites.
		b3-	Diagram the schemes that describe the types drug designs.

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***
b1-	Determine the methods used to calculate the properties of drug molecules	Lectures methods, Group Discussion, Problem solving sessions, brainstorming and Computer based teaching and learning	Oral Exam, Quizzes, Attendance, Participation, Short answers, homework, and Written exam.
b2-	Identify the 3D pharmacophore of drug and the binding sites		
b3-	Diagram the schemes that describe the types drug designs.		

(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 Practical Skills		**Course Intended Learning Outcomes (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-	Operate different pharmaceutical equipments and instruments and use emerging technologies in design, synthesis, pre-formulation, formulation, packaging, storage and analysis of pharmaceutical products according to GLP, GSP and cGMP guidelines.	**c1-**	Apply the docking procedures for design of some enzyme inhibitors.
C5-	Conduct research studies and utilize the results in different pharmaceutical fields.	**c2-**	Practice the drug design using some computer program.

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-	Apply the docking procedures for design of some enzyme inhibitors.	Lectures methods, group discussion and Computer based teaching and learning	Practical work on computer and homework.
c2-	Practice the drug design using some computer program.		

(D) General / Transferable Skills:

Alignment Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **General and Transferable skills**			
Program Intended Learning Outcomes (PILOs) in General / Transferable skills		**Course Intended Learning Outcomes (CILOs) in General / Transferable skills**	
After completing this program, students would be able to:		**After participating in the course, students would be able to:**	
D1-	Practice independent learning needed for continuous professional development	**d1-**	Work independently or collaboratively as a teamwork member to prepare seminars/ presentations or write reports to present some examples for drug design.
D5-	Apply information and communication technology and working effectively in a team	**d2-**	Use computer and technology efficiently to collect, analyze and interpret information to gain knowledge in field of drug discovery and design.
Alignment Learning Outcomes of General and Transferable skills to Teaching and Assessment Methods.			

Course Intended Learning Outcomes (CILOs) in General and Transferable Skills After participating in the course, students would be able to:		Teaching strategies/methods to be used.	Methods of assessment
d1-	Work independently or collaboratively as a teamwork member to prepare seminars/ presentations or write reports to present some examples for drug design.	Small group discussions and brainstorming	Homework and reports.
d2-	Use computer and technology efficiently to collect, analyze and interpret information to gain knowledge in field of drug discovery and design.		

XIII. Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1	**Introduction to Drug discovery, design and development**	a1, d1,d2	-Terminology related to Drug discovery, design and development - Stages of drug discovery, primary goals and major activities.	1	2

2	**Integral Part of Drug Discovery: from fragments, lead, drug-like molecule to drug molecule**	a2, b1, d1, d2	**-Lead compound and drug-like molecule** Finding a fragment and lead compound, What is a drug-like molecule Lipinski's Rule Veber Rules **-Basic concepts about drug targets** **What is drug molecule** **Structural Integrity of a Drug Molecule:** Pharmaceutical, Pharmacokinetic and Pharmacodynamic Phases **-Structural fragments of a drug molecule:** pharmacophore, toxicophore, metabophore **-The properties of drug molecules:** 1. solubility and partition coefficient 2. Shape (steric, conforma□onal, topological) proper□es 3. Stereochemical proper□es 4. Electronic properties **- Combinatorial and parallel synthesis in medicinal chemistry projects**	3	6
3	**Basic concepts of drug targets**	a3,d1, d2	- Protein as drug targets - Enzymes as drug targets - Receptors as drug targets - Nucleic acids as drug targets - Miscellaneous drug targets	2	4
4	**Mid Exam**	a1, a2, a3,b1		1	2

5	**Drug discovery, design, and development**	a4, b1, b2, b3, c1,c2, d1, d2	**-Molecular and quantum mechanics** Molecular mechanics Quantum mechanics Energy minimization **-Molecular properties:** Partial charges, Molecular electrostatic potentials, Molecular orbitals , Spectroscopic transitions , The use of grids in measuring molecular properties **-Conformational analysis** **-Structure comparisons and overlays** **-Identifying the active conformation** X-ray crystallography Comparison of rigid and non-rigid ligands **-3D pharmacophore identification:** X-ray crystallography Structural comparison of active compounds Automatic identification of Pharmacophores **-Docking procedures** **-Types of Computer aided drug design** **1-**Structure-based drug design (direct design) strategy (SBDD) 2- Ligand –based drug design (indirect design) strategy (LBDD) **-Docking procedures** **-Examples for drug modelling** **A- Optimizing target interactions** - Drug optimization: strategies in drug design **B- Optimizing access to the target**	6	12
6	**Getting the drug to market**	a5, d1,d2	**Preclinical and clinical trials** Toxicity testing Drug metabolism studies Pharmacology, formulation, and stability tests Clinical trials	1	2
7	**Review**	a1,a2,a3,a4,a5, b1, b2, b3, c1, c2		1	2
7	**Final Exam**	a1,a2,a3,a4,a5, b1, b2, b3, c1, c2		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

VII- a-Teaching strategies of the course:

Lecture method, Group Discussion, Problem solving sessions and Computer based teaching and learning, Tutorials and brainstorming.
b- Assessment Methods:
Oral Exam, Quizzes, Attendance, Participation, Short answers, reports, homework, and Written exam.

VII. Assignments:

No.	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Homework Assignments	a1-a4,b2,c1-2, d1-2	Sporadic through the semester	5
2	Reports	a1,a2, a5, b1, c1-2, d1-2		

VI. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs symbols)
1	**Attendance, Participation, reports and quizzes**	**All Weeks**	5	5%	a1-a4,b2,c1-2, d1-2
2	**Oral Tests and Homework-assignments**	Sporadic through the semester	5	5%	a1,a2, a5, b1, c1-2, d1-2
3	**Theoretical mid-semester exam**	7th	20	20%	a1, a2, a3, b1
4	**Final Exam (theoretical)**	**16th**	70	70%	a1,a2,a3,a4,a5, b1, b2, b3, c1, c2
	Total		**100**	**100%**	

VII. Students' Support:

Office Hours/week	Other Procedures (if any)
Two contact hours per week	None

VIII. Learning Resources:

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

3- Donald J. Abraham," BURGER'S Medicinal Chemistry and Drug Discovery" 6 th edition, A John Wiley and Sons, Inc, Virginia

4- John M. Beale, Jr. and John H. Block, 2011, "Text book of Organic Medicinal and Pharmaceutical Chemistry" 12th Edition, Wilson and Gisvold, Lippincott Williams and Wilkins, A Wolters Kluwer Company, Philadelphia.

2- Recommended Books and Reference Materials.

1- Andrew Davis A, E Ward S, 2015, "The Handbook of Medicinal Chemistry Principles and Practice". 3rd edition, The Royal Society of Chemistry. Cambridge

2- Povl Krogsgaard-Larsen, Tommy Liljefors and Ulf Madsen, 2002 , "Textbook of Drug Design and Discovery" Third edition, Taylor & Francis, London.

3- Jhoti H and Andrew R. L, 2007, "structure-based drug discovery" Springer, Dordrecht.

4- Thomas Nogrady, Donald F. Weaver, 2005,Medicinal Chemistry A Molecular and Biochemical Approach, 3rd edition, Oxford University Press, Inc., New York.

5- Graham L. Patrick, 2013, "An Introduction to Medicinal Chemistry" 5th Edition, Oxford University Press Inc, New York.

6- Thomas L. Lemke, Victoria F. Roche, David A. Willaiams and S. William Zito, 2008, "Foye's Principles of Medicinal Chemistry" 6 th, Edition,., Lippincott Williams & Wilkins, a Wolters Kluwer business, Philadelphia.

7- K-H. Hellwich C. D. Siebert, 2006, "Stereochemistry Workbook" Springer-Verlag Berlin Heidelberg, Berlin.

8- Lectures Notes.

3- Electronic Materials and Web Sites *etc*.

1- http://www.chemaxon/marvin

2- http://www.webmolecules.com

3-http://www.acdlabs.com

4- http://www.pdb.com

5-PASSPrediction of Activity Spectra for Substance) (http://www.ibmh.msk.su/PASS).

IX. Facilities Required:

1 - Accommodation:	- Well-equipped lecture halls with data show facilities, whiteboards, net connection, etc. - Well-equipped laboratories with all required equipment and reagents.
5 - Computing resources:	- Computer laboratory with internet facilities.

X. Course Improvement Processes:

16- 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).

17- 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).

18- 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 be encountered by the teaching staff and their mitigation in subsequent improved versions of course specification.

19- 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.

20- Procedures for periodically reviewing of course effectiveness and planning for improvement

- Student rating and feedback
- Peer rating and feedback
- Regular meeting of the Curriculum Committee of the faculty.

6- Course development plans

- Conducting regular workshops for the staff for improving their course specification skills.
- Regular revision of course specification and syllabus items.

IX. Course Policies: (including plagiarism, academic honesty, attendance etc)

The University Regulations on academic misconduct will be strictly enforced. Please refer to ----------

1 Class Attendance:

	▪ 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.
2	**Tardy:** - 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.
3	**Exam Attendance/Punctuality:** ▪ Exam attendance is obligatory unless being excused by the department and faculty. ▪ Absence from assignments or exams will be dealt with according to the general policy of the university.
4	**Assignments & Projects:** ▪ Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator. ▪ Projects: Not applicable.
5	**Cheating:** ▪ Punishment of cheating will be according to the general policy of the university in this respect.
6	**Plagiarism:** ▪ 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.
7	**Other policies:** ▪ General policies of the Students' Affairs of the University and the Quality Assurance Unit.