Ministry of Higher Education and Scientific Research Scientific Supervision and Scientific Evaluation Apparatus Directorate of Quality Assurance and Academic Accreditation Department

Academic Program and Course Description Guide

2025

1 Academic Program Description-Signature forms

University Name: Anbar University Faculty/Institute:

College of Pharmacy

Academic or Professional Program Name: Bachelor of Pharmacy Final Certificate Name: B.Sc. in Pharmacy

Academic System: Courses

Description Preparation Date: 1.5.2025 File Completion Date: 01.05.20 25

Signature:

Dean

Name: Prof. Dr. Mohammaed Kadhim Abdul Ameer

Date: 01.7.2025

Signature

Dean assistant for scientific affairs

Dr Rashad Mustafa Kaood

Date:1.7.2025

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department: Ass. Prof. Dr. Saad Al Khafagee

Date:

Signature:

The file was approved by the University president
Approval of the University president

1 Program Vision

The College of Pharmacy seeks to prepare graduates in the field of pharmaceutical sciences to work in the governmental and private departments.

2 Program Mission

The main mission of our program is to prepare and graduate scientific and leadership competencies in the field of pharmaceutical sciences and develop the required knowledge that reinforce different fields in the field of scientific research. Besides, the mission aims at recruiting competencies that serve the local, regional and international community, as well as training and refining students' minds scientifically and cognitively, emphasizing social and cultural values and responding to the requirements of the local market.

3 Program Objectives

1. Improvement of the pharmaceutical staff quality and empowering them with knowledge at the practical and applied levels in the field of specialization.
2. Encouraging the students to be self dependent while they perform their lab works and acquiring the required skills to perform all laboratory analyses.
3. Highlighting the scientific outputs through preparing a generation of pharmaceutical competencies capable of achieving pharmaceutical practices in the health, academic and industrial sectors.
4. Transferring all the theoretical knowledge into the practical experience
5. Graduating creative and innovative pharmacists who can implement their creativity after their graduation and keep pace with scientific and technical development in all pharmaceutical fields.
6. Attention to the research aspect based on the use of modern laboratory equipment for the purpose of providing graduates with applied skills (drug analysis, preparation of different pharmaceutical forms, extraction of therapeutic.

7. Preparing graduates with Bsc degree with the required competencies to join postgraduate studies and this can be attained through improving their creativity, scientific competencies and their ability to run research.

8. Familiarity with the applied aspects of the patient's pharmacological uses and interest in the clinical application of theoretical information.

9. Encouraging students to pay attention to modern pharmaceutical aspects such as the use of computers in the pharmaceutical aspects and the discovery.

4 Program Accreditation

Local (National Accreditation Standards for Classification)

5 Other external influences

Scientific library, international information network, field visits to health institutions, pharmaceutical laboratories and pharmacies of the private sector.

6 Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Remarks
Institution Requirements	10	16	9%	Essential
College Requirements	53	166	90.5%	Essential
Department Requirements				Essential
Summer Training	Yes			Essential
Other	Graduation project	1	0.5%	Essential

Program Description

Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
First Year-First Semester	PH1811111	Analytical Chemistry	3	2
	PH1811611	Computer Sciences	----	2
	PH1811211	Human biology	2	2
	PH1811711	Mathematics and Biostatistics	3	----
	PH1811311	Medical Terminology	1	----
	PH1811511	Principles of Pharmacy Practice	2	----
	PH1811811	Democracy & Human Rights	2	----

Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
First Year- Second Semester	PH1812111	Human Anatomy	1	2
	PH1812511	Human Histology	2	2
	PH1812311	Medical Physics	2	2
	PH1812411	Organic Chemistry I	3	2
	PH1812211	Pharmaceutical Calculation	2	2
	PH1812611	Computer Sciences	----	2
	PH1812711	English Language	2	----

Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
Second Year- First Semester	PH1821511	Baath's Party Crimes	2	----
	PH1821411	Medical Microbiology I	3	2
	PH1821211	Organic Chemistry II	3	2
	PH1821111	Physical Pharmacy I	3	2
	PH1821311	Physiology I	3	2
	PH1821611	Computer Sciences	----	2
	PH1821711	Democracy	1	----

Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
Second Year- Second Semester	PH1823411	Medical Microbiology II	3	2
	PH1823511	Organic Chemistry III	2	2
	PH1823211	Pharmacognosy I	3	2
	PH1823111	Physical Pharmacy II	3	2
	PH1823311	Physiology II	3	2
	PH1823611	Computer Sciences	----	2
	PH1823711	Arabic Language	2	----

Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
Third Year- First Semester	PH1831311	Biochemistry I	3	2
	PH1831211	Inorganic Pharmaceutical Chemistry	2	2
	PH1831811	Pathophysiology	3	2
	PH1831511	Pharmaceutical Technology I	3	2
	PH1831111	Pharmacognosy II	2	2

Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
Third Year- Second Semester	PH1833111	Biochemistry II	3	2
	PH1833611	Pharmacy Ethics	1	----
	PH1833511	Organic Pharm. Chemistry I	3	2
	PH1833211	Pharm.Technology II	3	2
	PH1833311	Pharmacognosy III	2	2
	PH1833411	Pharmacology I	3	----

Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
Fourth Year- First Semester	PH1841111	Biopharmaceutics	2	2
	PH1841811	Clinical Pharmacy I	2	2
	PH1841211	Organic Pharm.Chemistry II	3	2
	PH1841311	Pharmacology II	3	2
	PH1841511	Public Health	2	----

Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
Fourth Year- Second Semester	PH1842111	Communication Skills	2	----
	PH1842611	Clinical Pharmacy II	2	2
	PH1842311	General Toxicology	2	2
	PH1842211	Industrial Pharmacy I	3	2
	PH1842511	Organic Pharm. Chemistry III	3	2
	PH1842411	Pharmacology III	2	----

Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
Fifth Year- First Semester	PH1853111	Applied Therapeutics- I	3	----
	PH1851111	Clinical Chemistry	3	2
	PH1856111	Hospital Training	----	4
	PH1854111	Clinical Toxicology	2	2
	PH1852111	Industrial Pharmacy- II	3	2
	PH1855111	Org. Pharm. Chem. IV	2	----
	PH1857111	Graduation project	1	----

Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
Fifth Year- Second Semester	PH1852511	Advanced Pharmaceutical Analysis	3	2
	PH1852411	Applied Therapeutics- II	2	----
	PH1852111	Dosage Form Design	2	----

	PH1852611	Clinical Laboratory Training	----	4
		Pharmacoeconomic	2	----
	PH1852211	Therapeutic Drug Monitoring (TDM)	2	2
	PH1852311	Pharmaceutical Biotechnology	1	----

8 Expected learning outcomes of the program

8. **Expected learning outcomes of the program**
Knowledge
1. Knowledge of the basics of various sciences related to the human body and diseases, such as: microbiology, physiology, organic, inorganic and life chemistry, pathophysiology, immunology, anatomy, histology and medical statistics 2. The students must gain an ability of the assessment of the drugs side effects and their toxicity. 3. Knowledge of the classification of the drugs the characteristics of the drug, its mechanism of action and the side effects caused by its use. Knowing the appropriate medication for the patient according to the pathological condition, medical history and diagnosis through clinical application 4. Know the physical and chemical properties of the compounds involved in the pharmaceutical industry and determine the appropriate pharmaceutical forms for each substance accordingly 5. Familiarity with the pharmaceutical industry and the mechanism of preparation of various pharmaceutical forms. Identify the important devices involved in pharmaceutical manufacturing. 6. Knowledge about the principles of biostatistics and pharmaceutical economics. 7. Knowledge about medical physics and its application in the different types of medical fields. 8. Knowledge about the concept of civilization and human rights so as to prepare pharmacists aware about their civil rights and duties.

Skills
1. Acquir good skills and practices to work in pharmaceutical labs and working within the rules and regulations of the occupational safety/ 2. Acquiring skills of self-dependence and self-learning. 3. Acquiring skills in drugs manufactory and assessment of different pharmaceutical dosage forms. 4. Acquiring good communication skills to deal with the patients in a professional and scientific manner. 5. Acquiring pharmaceutical skills related to the sources of the drugs, the original brands and how to choose the best types of drugs. 6. Acquiring good communication skills to deal with the medical staff in a professional and scientific manner.
Ethics
1. Developing students' abilities to share ideas. 2. Developing students' abilities to deal with patients and medical staff in health- care institutions. 3. Developing students' knowledge of research ethics and the team work.

9 Teaching and Learning Strategies

Explain the scientific material to students in detail in the lecture halls. Establishment of open discussion and dialogue about different aspects in the pharmaceutical field. Making scientific and field visits to hospitals and industrial bodies.

10 Evaluation methods

Establishment of Exams in which mixed theoretical questions are posed like essay questions or multiple choice questions

Asking the students to perform daily tasks and duties (classroom or classroom)

Establishment of open discussions and seminars about different aspects in the pharmaceutical field.

Laboratory reports on applied trials or clinical cases

Graduation project (for the fifth stage).

Faculty

11. Faculty						
Faculty Members						
Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professors	Pharmacy	Pharmaceutical Chemistry	Teaching Theoretical		1	
	Veterinary medicine	Pharmacology	Teaching Theoretical		1	
	Agriculture	Pharmacognosy	Teaching Theoretical		1	
		Clinical pharmacy				

Lecturer	Pharmacy	Pharmacology and Toxicology	Teaching Theoretical	Teaching Practical	4	
		Clinical Pharmacy	Teaching Theoretical	Teaching Practical	2	
		Pharmaceutics	Teaching Theoretical	Teaching Practical	1	
		Pharmaceutical Chemistry	Teaching Theoretical	Teaching Practical		2
		Biochemistry	Teaching Theoretical	Teaching Practical	2	
Assistant Lecturer	Pharmacy	Pharmacology	Teaching Theoretical	Teaching Practical	2	
		Clinical pharmacy	Teaching Theoretical	Teaching Practical	1	
		Pharmaceutical Chemistry	Teaching Theoretical	Teaching Practical	1	

		Pharmaceutics	Teaching Theoretical	Teaching Practical	1	

	Engineering	Computer Science	Teaching Theoretical	Teaching Practical	1	
Assistant Lecturer	Law	Law	Teaching Theoretical	Teaching Practical	1	

12 Program Development Plan

Using new concepts in the field of pharmaceutical sciences and using electronic devices to display information and issues E-learning by sharing websites and links Student seminars and debates Work as a research team in the form of research groups

13 . Acceptance Criterion

12.	Acceptance Criterion
Central Admission	

14 The most important sources of information about the program

University Central Library (Book based and Electronic Library) College Library (Book based and Electronic Library)
Textbooks for pharmacy faculties
Websites
YouTube Movies

15 Program Skills Outline

Required learning outcome																	Subjects	Code	Year
Values			Skills						Knowledge										
3	2	1	6	5	4	3	2	1	8	7	6	5	4	3	2	1			
		√					√	√								√	Human Biology	PH18.1.1.2.1.1	First stage- First semester
√		√	√	√			√					√					Principles of pharmacy	PH18.1.1.4.1.1	
√		√		√		√	√	√					√				Analytical chemistry	PH18.1.1.1.1.1	
			√				√									√	Medical Terminology	PH18.1.1.3.1.1	
							√				√						Mathematics and statistics	PH18.1.1.6.1.1	
							√				√						Computer	PH18.1.1.7.1.1	
							√		√								Human rights	PH18.1.1.5.1.1	
		√	√				√	√								√	Anatomy	PH18.1.25.1.1	First stage- second semester
√		√		√		√	√	√				√					Pharmaceutical calculation	PH18.1.2.2.1.1	
√		√					√	√		√							Medical physics	PH18.1.2.3.1.1	
√		√				√	√	√					√				Organic chemistry 1	PH18.1.2.4.1.1	
√		√	√				√	√								√	Histology	PH18.1.2.1.1.1	
		√					√				√						Computer ١	PH18.1.25.6.1	
		√				√	√	√					√				Organic chemistry II	PH18.2.1.2.1.1	Second stage- First semester
√		√	√				√	√								√	Physiology I	PH18.2.1.3.1.1	
√		√					√	√								√	Microbiology I	PH18.2.1.4.1.1	
√		√				√	√	√				√					Physical pharmacy I	PH18.2.1.1.1.1	
		√					√	√			√						Computer science I	PH18.2.1.6.1.1	
							√		√								Civil crimes	PH18.2.1.5.1.1	
		√					√	√								√	Physiology II	PH18.2.2.3.1.1	second stage- second semester
		√					√	√				√	√				Organic chemistry III	PH18.2.2.6.1.1	
		√				√	√	√		√		√	√				Physical pharmacy II	PH18.2.2.1.1.1	
		√					√	√								√	2Microbiology II	PH18.2.2.4.1.1	
		√					√	√			√						Computer Science II	PH18.2.2.5.1.1	
		√				√	√	√				√	√	√	√		Pharmacognosy I	PH18.2.2.2.1.1	
			√				√		√								Arabic.	PH18.2.2.7.1.1	
		√				√	√	√				√	√				Inorganic pharmaceutical chemistry	PH18.3.1.2.1.1	Third stage- First

Required learning outcome																Subjects	Code	Year
Values			Skills						Knowledge									
3	2	1	6	5	4	3	2	1	8	7	6	5	4	3	2	1			
		√					√	√					√	√	√	√	Biochemistry	PH18.3.1.3.1.1	semester
		√					√	√								√	Pathology	PH18.3.1.4.1.1	
		√		√		√	√	√				√	√	√	√		Pharmacognosy II	PH18.3.1.1.1.1	
		√				√	√	√		√			√				Pharmaceutical Technology	PH18.3.1.5.1.1	
		√				√	√	√				√	√				Organic pharmaceutical 1chemistry	PH18.3.2.5.1.1	Third stage- second semester
		√					√	√					√	√	√	√	Biochemistry I	PH18.3.2.2.1.1	
√	√		√				√		√								Medical ethics	PH18.3.2.7.1.1	
		√		√		√	√	√				√	√	√	√		Pharmacognosy III	PH18.3.2.3.1.1	
		√				√	√	√		√							Pharmaceutical technology	PH18.3.2.2.1.1	
		√		√			√							√	√	√	Pharmacology I	PH18.3.2.4.1.1	
		√				√	√	√				√	√				Organic pharmaceutical chemistry II	PH18.4.1.2.1.1	Fourth stage- First semester
		√					√	√					√		√	√	Biochemistry II	PH18.4.1.1.1.1	
√	√	√	√	√			√	√						√	√	√	Clinical Pharmacy	PH18.4.1.4.1.1	
√	√	√	√	√			√							√	√	√	Public Health	PH18.4.1.5.1.1	
		√		√			√	√						√	√	√	Pharmacology II	PH18.4.1.3.1.1	
		√				√	√	√				√	√				Organic pharmaceutical chemistry III	PH18.4.2.5.1.1	Fourth stage- second semester
		√				√	√	√		√							Industrial pharmacy I	PH18.4.2.2.1.1	
√	√	√	√		√		√	√						√	√	√	Clinical Pharmacy II	PH18.4.2.6.1.1	
√	√		√		√												Communication Skills	PH18.4.2.1.1.1	
		√					√	√						√	√	√	General Toxicology	PH18.4.2.3.1.1	
		√		√			√							√	√	√	Pharmacology III	PH18.4.2.4.11	
		√				√	√	√				√	√				Organic pharmaceutical chemistry VI	PH18.5.1.5.11	Fifth stage- First semester
√	√	√	√		√		√	√						√	√	√	Clinical Toxicology	PH18.5.1.4.11	
√	√	√			√		√	√				√		√	√	√	Clinical Chemistry	PH18.5.1.1.11	
		√					√	√		√							Industrial pharmacy II	PH18.5.1.2.11	
√	√	√	√	√			√	√						√	√	√	Therapeutics I	PH18.5.1.3.11	

Required learning outcome																	Subjects	Code	Year
Values			Skills						Knowledge										
3	2	1	6	5	4	3	2	1	8	7	6	5	4	3	2	1			
		√					√				√						Pharmacoeconomics	PH18.5.2.5.11	Fifth stage – second semester
√	√	√	√	√	√		√							√	√	√	Therapeutics II	PH18.5.2.2.11	
		√					√			√		√	√	√			Dosage form	PH18.5.2.1.11	
		√				√	√	√				√		√	√	√	Pharmaceutical biotechnology	PH18.5.2.4.11	
		√					√					√		√	√	√	Therapeutic drug monitoring	PH18.5.2.3.11	
√	√	√	√	√	√		√							√	√	√	Hospital training	PH18.5.2.6.11	
		√					√	√								√	Lab training	PH18.5.2.7.11	
√	√	√	√			√	√					√		√	√	√	Graduation project	PH18.2.1.2.1.1	

15.1 Academic courses for the first stage

15.1.1 First Stage- First Semester

15.1.1.1 Analytical chemistry -Course Description Form

1. Course Name:					
Analytical chemistry (Theoretical+ Practical)					
2. Course Code:					
PH1811111					
3. Semester / Year:					
1st Semester/1st year					
4. Description Preparation Date:					
1-5- 2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 hours Theoretical + 3 hours Practical /4 units					
7. Course administrator's name (mention all, if more than one name)					
Theoretical					
Dr Haneen Subhi E mail :- Haneen.subhi@au.edu.iq					
Practical					
Dr Assel Hadi E mail Aseel.hadi@au.edu.iq					
8. Course Objectives					
Course Objectives	- Preparing students and supporting them with information rela to qualitative and quantitative chemical analyzes and studying theories related to that.				
9. Teaching and Learning Strategies					
Strategy	Lecturing Seminars Homework Quiz Mid-term & final exams				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluatio n method
1	3+2	Review elementary concept important	Introduction to analytical chemistry	Theoretical lectures Practical	Paper-base exams

		electrolytes, importance		(Laboratory safety rules)	
2	3+2	Review elementary and concentration	Introduction to analytical chemistry	Theoretical lectures Practical(Glass ware laboratory)	Paper-base exams
3	3+2	The evaluation of analytical data: Definition of terms	Introduction to analytical chemistry	Theoretical lectures Practical(Prepa re solutions from solids and liquids)	Paper-base exams
4	3+2	The evaluation to gravimetric data, definition of terms	Quantitative analysis	Theoretical lectures. Practical(Titrat ion principles)	Paper-base exams
5	3+2	An introduction to gravimetric analysis: Statistical analysis of data; rejection of data; precipitation methods; gravimetric factor	Quantitative analysis	Theoretical lectures Practical (Titration of HCl with sodium Carbonate)	Paper-base exams
6	3+2	The scope of applications of gravimetric analysis: Inorganic precipitating agents; organic precipitating agents	Quantitative analysis	Theoretical lectures Practical (Titration of HCl with NaOH)	Paper-base exams
7	3+2	An introduction to volumetric methods of analysis: Volumetric calculations; acid- base equilibria and pH calculations	Quantitative analysis	Theoretical lectures Practical (Titration ofKMno4 with oxalate acid)	Paper-base exams
8	Mid-term Exam				
9	3+2	Buffer solutions: Theory of neutralization	Quantitative analysis	Theoretical lectures	Paper-base exams

		titrations of simple system		Practical (unknown sample determination)	
10	3+2	Theory of neutralization titrations of complex system; Precipitation titrations	Quantitative analysis	Theoretical lectures Practical (Titration of Kmno4 with ferrous sulfate)	Paper-base exams
11	3+2	Calculation of pH in complex system; Volumetric methods based on complex system	Quantitative analysis	Theoretical lectures Practical (Determination of chloride by Mohr method)	Paper-base exams
12	3+2	Calculation of pH in complex system; Volumetric methods based on complex system	Quantitative analysis	Theoretical lectures Practical (unknown sample determination)	Paper-base exams
13	3+2	Equilibria in oxidation-reduction system; theory of oxidation-reduction titrations	Quantitative analysis	Theoretical lectures Practical (Determination of water hardness)	Paper-base exams
14	3+2	Spectrophotometric analysis: An introduction to optical methods of analysis; Methods based on absorption of radiation	Advanced analytical techniques	Theoretical lectures Practical (unknown sample determination)	Paper-base exams
15	Final Exam				

11. Course Evaluation
20 M: theoretical assessment; (paper-based mid-term exam + quiz + attendance + seminars) 20 M: practical assessment (attendance + quiz + practice + unknown sample assessment) 60 M: paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1- Fundamentals of Analytical chemistry by koog and West 8th.ed.(2008).
	2-Chemical Analysis in the Laboratory A BasicGuide, by I.Mueller-Harvey and R. M. Baker,ISBN 0-85404-646-1.

Main references (sources)	Modern Pharmaceutical Drug Analysis, by L. Zechmeister) And L. Von.Cholnoky, ISBN (13): 978-81-224-2718-9
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

15.1.2 Mathematics and Biostatistics -Course Description form

1. Course Name:
Mathematics and Biostatistics
2. Course Code:
PH1811511
3. Semester / Year
1st Semester/1st year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical (45)/ 3 units
7. Course administrator's name
Theoretical
الاسم : د. زياد شهاب احمد حسين السراج الايميل: ziad.shihab@au.edu.iq
8. Course Structure

Week	Hours	Unit or subject name	Learning method	Evaluation method
1	3	Integration	Theoretical lectures.	Paper-based exams
2	3	Introduction to statistics	Theoretical lectures.	Paper-based exams
3	3	Differentiation	Theoretical lectures.	Paper-based exams
4	3	Descriptive statistics	Theoretical lectures.	Paper-based exams
5	3	Derivatives	Theoretical lectures.	Paper-based exams
6	3	The mean, the median, and the mode	Theoretical lectures.	Paper-based exams
7	3	Graphs	Theoretical lectures.	Paper-based exams
8	3	Measures of dispersion	Theoretical lectures.	Paper-based exams
9	3	General test		Paper-based exams
10	3	Triangles	Theoretical lectures.	Paper-based exams
11	3	Standard deviation	Theoretical lectures.	Paper-based exams
12	3	Logarithms	Theoretical lectures.	Paper-based exams
13	3	Possibilities	Theoretical lectures.	Paper-based exams

14	**3**	**Objectives**	**Theoretical lectures.**	**Paper-based exams**
15	**3**	**General test**		

9. Course Evaluation

- **30 M Theoretical assessment;**

(paper-based mid-term exam + quiz + attendance)

- **70 M paper-based theoretical final exam**

_____

Total 100 M

10. Learning and Teaching Resources

Required textbooks	**Thomas GB, Finny RI. Calculus Analytical Geometry. 9th edition, 2009.** **Daniel WW. Biostatistics: A Foundat for Analysis in the Health Science, 1 edition, 2013, wiley.**

15.1.3 Human Biology -Course Description Form

1. Course Name:
Human Biology (Theoretical+ Practical)
2. Course Code:
PH1811211
3. Semester / Year:
1st Semester/1st year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms: Excel sheet
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours Theory + 2 hours Practical/ 3 unites
7. Course administrator's name
Theoretical
Prof. Madeha Hamodi E mail Madeha.hamodi@au.edu.iq
Practical
Lecturer:- Salim Dawood Email: Salim.Dawood@au.edu.iq
8. Course Objectives

Course Objectives To make the student familiar with the fundamentals of the human body biology.	Study the human body considering cell biology, genetics and basic histological structure. . At the end of the course the student should be familiar with the fundamentals of the human body biology.
9. Teaching and Learning Strategies	
Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations, microscopic slides and Lab book catalogue

10. Structure

	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+2	Importance and History of cell biology	Introduction to Human Biology The microscope	Theoretical lectures & practical	Paper-based exams
2	2+2	About The cell	General features of the cells	Theoretical lectures & practical	Paper-based exams
3	2+2	About Structure and function of Nucleus	Structure and function cells	Theoretical lectures & practical	Paper-based exams

4	2+2	About Endomembrane System ,Mitochondria, Ribosome	Structure and function cells	Theoretical lectures & practical	Paper-based exams
5	2+2	About the cytoskele and Cell Moveme Related Parts: Microfilaments, Centrioles, ilia, Cilia and Flagella	The Cytoskeleton	Theoretical lectures & practical	Paper-based exams
6	2+2	About different types of epithelial tissues	Epithelial tissues	Theoretical lectures & practical	Paper-based exams
7	2+2	About different types of Connective tissues	Connective tissue	Theoretical lectures & practical	Paper-based exams
8	Mid-term Exam				
9	2+2	About The methods of passing large and small through	Transport between cells and their surroundings	Theoretical lectures & practical	Paper-based exams
10	2+2	About the structure and function of Bone and cartilage	Bone and cartilage. Excretory system	Theoretical lectures & practical	Paper-based exams
11	2+2	About the structure and function of nervous system and skin	Central nervous system, skin, Respiratory system	Theoretical lectures & practical	Paper-based exams
	2+2	About Chromosomes and semi lethal genes.	Human genes and Chromosomes	Theoretical lectures & practical	Paper-based exams
13	2+2	About Macronutrients, Micronutrients, vitamins,	Nutrition	Theoretical lectures & practical	Paper-based exams
14	2+2	About the innate immunity and acquired immunity	Immunity and the blood, Inflammation.	Theoretical lectures & practical	Paper-based exams
11. Course Evaluation					

20 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance) 20 M practical assessment (attendance + quiz + practice) 60 M paper-based theoretical final exam 100 M total _____	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Text Book of human Biology, 5thed. 2005 By: Johnks and lnglis
Main references (sources)	Human Biology By:Michael Windelspec 14th Edition Human Molecular Genetics ByTom Strac 5th Edition
Recommended books and references (scientific journals, reports...)	Journal of Cell Biology(JCB)

15.1.4 Medical Terminology -Course Description Form

1. Course Name:
Medical Terminology
2. Course Code:
. PH1811311
3. Semester / Year:
1st Semester/ 1st year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Attendance Excel sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
1 hour per week (10h) / 1 unit
7. Course administrator's name
Dr. Salim Dawood salim.dawwod@au.edu.iq
8. Course Objectives

Course Objectives	1-Recognize and understand basic medical terms. 2-Identify and decipher medical abbreviations. 3-Spell and pronounce basic medical terminology. 4-Analyze unfamiliar terms using the knowledge of word roots, suffixes prefixes gained in the course.
9. Teaching and Learning Strategies	
Strategy	1- Lectures and interactive presentations 2- Self-directed learning and research projects 3- Interactive workshop and seminars 4- Assessment strategies

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Acquired terminological knowledge	General introduction	lectures	Quizzes and exams
2	1	Acquired terminological knowledge	prefixes	lectures	Quizzes and exams
3	1	Acquired terminological knowledge	suffixes	lectures	Quizzes and exams

4	1	Acquired terminological knowledge	Bone and joint Lymphatic system	lectures	Quizzes and exams
5	1	Acquired terminological knowledge	Cardiovascular system	lectures	Quizzes and exams
6	1	Acquired terminological knowledge	Central nervous system	lectures	Quizzes and exams
7	1	Acquired terminological knowledge	Gastrointestinal system	lectures	Quizzes and exams
8	**Mid-term exam**				
9	1	Acquired terminological knowledge	Respiratory system	lectures	Quizzes and exams
10	**Students' seminars**				

10. Course Evaluation

- 30 M mid-term (quizzes (5%); midterm exam (25%))
- 70 M final paper-based exam

_____

- 100 M total

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Medical Terminology: A Living Language (4th Edition) - Softcover Fremgen, Bonnie F.; Frucht, Suzanne S.
Main references (sources)	Medical Terminology For Dummies: 3rd Edition By Beverley Henderson, CMT-R, HRT Jennifer L. Dorsey With: Randye Kaye Publisher Tantor Audio
Recommended books and references (scientific journals, reports...)	Quick & Easy Medical Terminology A Paperback edition Peggy C. Leonard in English (2 Nov 2024).
Electronic References, Websites	https://www.schulich.uwo.ca/pathol//about_us/resources/gssary_of_medical_terms.html

15.1.5 Principles of pharmacy

1. Course Name:
Principles of Pharmacy Practice (Theoretical)
2. Course Code:
. PH1811411
3. Semester / Year:
1st Semester/1st year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours Theoretical (30) /2 units
7. Course administrator's name
Theoretical
Lecturer assistant :- Aseel Hadi Abdul Ameer E mail Aseel.Hadi@au.edu.iq
8. Course Objectives
Course Objectives Learning the principles and practice of pharmaceutical calculations and drug compounding, this includes converting numbers and numerals between systems, correlation between house hold measures and pharmaceutical expressions for weight and volume, abbreviations most commonly used in pharmacy, metric system, the prescription or medication order, reducing and enlarging formula as well as learning the principles of ratio strength calculations and the percentage of error.
9. Teaching and Learning Strategies

Strategy	Lecturing Seminars Homework Quiz

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	Methods of expression of quantities.	The Roman numbers and numerals, units of weight and volume.	Theoretical lectures.	Paper-based exams
2	2	Calculating the smallest amount of a substance, the error potential.	The percentage of error	Theoretical lectures. .	Paper-based exams
3	2	Types of the Rx, parts of the Rx, examples on Rx.	The prescription o the medication Order.	Theoretical lectures.	Paper-based exams
4	2	Tutorial and practical problems	Tutorial and pract problems	Theoretical lectures.	Paper-based exams

5	2	Abbreviations most commonly used in pharmacy, tables of interconvertion systems.	The metric system	Theoretical lectures.	Paper-based exams
6	2	Knowing the formula that specify a known amount of the drug, formula that specify a known parts of the drug.	Reducing and enlarging formula	Theoretical lectures.	Paper-based exams
7	2	Percentage and ratio strength calculations, w/w %, v/v%, w/v%	Percentage and ratio strength calculations	Theoretical lectures.	Paper-based exams
8	**Mid-term exam**				
9	2	Tutorial and practical problems	Tutorial and practical problems	Theoretical lectures.	Paper-based exams
10	2	Miscellaneous problems regarding calculation of doses, correlating the total amount to the size of dose.	Calculation of doses	Theoretical lectures.	Paper-based exams
11	2	Calculation of dose according to patient weight, calculation of dose according to patient age, practice problems.	Calculation of dose	Theoretical lectures.	Paper-based exams
12	2	Calculation of dose according to body surface area, the use of nomograms in dose calculation, tutorial and practice problems	Calculation of dose	Theoretical lectures.	Paper-based exams
13	**Students' seminars**				

11. Course Evaluation

- 30 M Theoretical assessments;

(paper-based mid-term exam + attendance + seminar)

- 70 M paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources

Required textbooks	Ansel HC, Stoklosa MJ. Pharmaceutical calculations 13th

	edition Philadelphia, PA: Lippincott. Williams and Wilkins, 2010
Main references (sources)	1. Ansel HC, Stoklosa MJ. Pharmaceutical calculations ,10th , 13th edition Philadelphia, PA: Lippincott. Williams and Wilkins, 2010 2. Remington: The science and practice of pharmacy.
Electronic References, Websites	https://www.pharmacist.com/

15.1.6 Computer Science 1-Course Description Form

1. Course Name:
Computer Science 1
2. Course Code:
PH1811711
3. Semester / Year:
1st Semester/ 1st year
4. Description Preparation Date:
1/1/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 h per week (30)/1unit
7. Course administrator's name
الاسم : د. زياد شهاب احمد حسين السراج الايميل: ziad.shihab@au.edu.iq

8. Course Objectives	
Course Objectives	Give the students the most important information about computers and their uses. The students will learn and appreciate computer skills as well as the most importa software (programs) used on the PC. Furthermore, learning the hardware and physical components that make up a computer system is crucial. However, the numeral systems show the way to represent or express numbers.

9. Teaching and Learning Strategies	
Strategy	Quizzes, practical and theoretical examinations

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction to computer science and IT	Introduction computer science IT	Practical application	Practical-based exams quizzes
2	2	Computer architecture and terminals	Computer	Practical application	Practical-based exams and quizze
3	2	Operating systems Windows	Operating	Practical application	Practical-based exams and quizze
4	2	Numerical systems (1)	Numerical systems (1)	Practical application	Practical-based exams and quizze

5	2	Numerical systems (2)	Numerical systems (2)	Practical application	Practical-based exams and quizze
6	2	Microsoft word (1)	Microsoft word (1)	Practical application	Practical-based exams and quizze
7	2	Tutorial	Tutorial		
8	2	Microsoft word (2)	Microsoft word (2)	Practical application	Practical-based exams and quizze
9	2	Tutorial			
10	2	Microsoft word (3)	Microsoft word (3)	Practical application	Practical-based exams and quizze
11	2	Tutorial	Tutorial		
12	2	Microsoft PowerPoint (1)	Microsoft	Practical application	Practical-based exams and quizze
13	2	Tutorial			
14	2	Microsoft PowerPoint (2)	Microsoft	Practical application	Practical-based exams and quizze
15	2	Tutorial			

11. Course Evaluation

- 40 M practical assessment (attendance + quizzes + practice)
- 60 M paper-based theoretical final exam

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books)	Computer Science Textbook 8 Windows 10 & MS Office 2016 by Content Team Orange (Author)
Main references (sources)	Lab. Manual for Practical Computer Science adopted by the department.
Recommended books and references (scientific journals, reports...)	محمد بالل الزعبي، د .الحاسوب والبرمجيات الجاهزة، د احمد. الشرايعة، الجامعة االردنية،2008
Electronic References, Websites	YouTube

15.1.7 Baath's Party Crimes -Course Description Form

1. Course Name:
Baath's Party Crimes (Theoretical)
2. Course Code:
PH1811611
3. Semester / Year:
1st Semester/ 2nd year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours a week (30 h total) \ 2 units
7. Course administrator's name (mention all, if more than one name)
Dr Hiba Hatem E mail Hiba.hatem@au.edu.iq

8. Course Objectives	
Course Objectives	Enable the student to learn about local and international laws, especially those dealing with human rights issues and violations committed against them, and raise the level of his legal culture that makes him adopt them to reject these violations, whether inside or outside the state system to which he belongs. Enable the student to identify the types of crimes committed within the country and distinguish between them and crimes against humanity by identifying their characteristics, foundations and laws that apply to them. Introducing the laws of the International Criminal Court against humanity, and the laws of the Iraqi Supreme Criminal Court in 2005, documenting the Baath Party regime's violations of humanity during its period of rule.

9. Teaching and Learning Strategies	
Strategy	Explain Brainstorming Dialogue and discussion Quiz

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understand the lecture	Concept and definition of crimes and its sections	Theoretical lectures	Question and Answer
2	2	Understand the lecture	Position of court law The Iraqi	Theoretical lectures	Question and Answer + Quiz

			Supreme Criminal Court in 2005, a violation of the regime Resurrection and the most important decisions issued by it		
3	2	Understand the lecture	Types of international crimes	Theoretical lectures	Question and Answer
4	2	Understand the lecture	The role of the Baath regime in psychological violations and their effects consequences	Theoretical lectures	Question and Answer + Quiz
5	2	Understand the lecture	The role of the Baath regime in Social violations and their effects consequences	Theoretical lectures	Question and Answer
6	2	Understand the lecture	The position of the Baath regime Of religion and religious institutions	Theoretical lectures	Question and Answer
7	2	Understand the lecture	The role of the Baath regime in violation Human Rights Laws	Theoretical lectures	Question and Answer + Quiz
8	Mid-term exam				
9	2	Understand the lecture	Violations of the Baath regime Political and military	Theoretical lectures	Question and Answer
10	2	Understand the lecture	The Baath regime's environmental violations in Iraq/ war pollution	Theoretical lectures	Question and Answer
11	2	Understand the lecture	The Baath regime's environmental violations in	Theoretical lectures	Question and Answer

			Iraq/ destruction of cities and villages		
12	2	Understand the lecture	The Baath regime's violations of the environment in Iraq/drying up marshes and orchards	Theoretical lectures	Question and Answer
13	2	Understand the lecture	Legal and legitimate adjustment For the crime of mass graves	Theoretical lectures	Question and Answer
14	2	Understand the lecture	The role of the Baath regime in the events Mass graves in Iraq	Theoretical lectures	Question and Answer
15	2	Understand the lecture	Legal adaptation of crimes Mass graves during the rule of the Baath regime	Theoretical lectures	Question and Answer
	Final- term exam				

11. Course Evaluation
30 M Theoretical assessment; (attendance + Participate in the general discussion (Question and Answer) + quiz + paper- based mid-term exam) 70 M paper-based theoretical final exam _____ 100 M total

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Book: Crimes of the Baath Regime in Iraq, (Iraq, Ministry of Higher Education and Scientific Research, 2024(.
Main references (sourc	Dr. Ghassan Karim Majthab and Dr. Amjad Zein Al-Abidin Tumaa, Human Rights and Democracy, 2018. Zuwaina Al-Walid, The Crime of Genocide in Light of the Jurisprudence of the International Criminal Court for Rwanda, unpublished master's thesis, (University of Algiers, Faculty of Law, Ben Aknoun, 2013). Constitution of Iraq of 2005.
Electronic Websites	United Nations Universal Declaration of Human Rights 1948, https://www.supremecourt.ge Iraqi Supreme Criminal Court Law No. (10) of 2005, https://menarights.org/sites/default/files/2016-11/IRQ_Supreme%20Criminal%20Court%20Act_2005_AR_0.pdf

	Report: United Nations Legislation in Chapter Four/Crimes againstHumanity, 2017,

15.1.8 Democracy-Course description form

1. Course Name:	
Democracy (Theoretical)	
2. Course Code:	
PH1812611	
3. Semester / Year:	
First semester/ 2025-2024	
4. Description Preparation Date:	
1-5-2025	
5. Available Attendance Forms:	
Students' signature on attendance sheet	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours a week (30 h total)\ 2 units	
7. Course administrator's name (mention all, if more than one name)	
Dr Hiba Hatem mail :- Hiba.hatem@au.edu.iq	
8. Course Objectives	
Course Objectives	• Identifying the development and historical origins of the concept of democracy and its types, and methods of diagnosing the reasons for the decline of its practice in the political systems of countries and how to solve it. • Identifying the components and characteristics of democracy and laying its correct foundations in the political systems of countries, in order to ensure that its citizens enjoy its outcomes and arm themselves with the force of law to defend the privileges emanating from it and build a free society that believes in its full and undiminished rights and the duties entrusted to it in order to protect the political system from decay and chaos. • Identify the most important relationship between democracy, human rights, and civil society institutions, through influence and influence among them, and what are the outcomes and results of these relationships, and how they contribute to building a democratic society in which the political system guarantees public rights and freedoms. • Enabling individuals to participate effectively in choosing the form of government that achieves the foundations of coexistence, understanding, tolerance and respect among the people of one people with their various ideological, religious, linguistic and ethnic orientations.
9. Teaching and Learning Strategies	
Strategy	• Explain • Brainstorming • Dialogue and discussion • Quiz

15.2 First stage- Second semester

15.2.1 Organic Chemistry I-Course Description Form

1. Course Name:
Organic Chemistry I
2. Course Code:
PH1812411
3. Semester / Year:
2nd Semester, 1st year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signatures on attendance sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours theory + 2 hours practical (60) / 4 units
7. Course administrator's name

Theory	
Zaid O Ibraheem	zaid.osama@au.edu.iqDr الايميل
Practical	
zaid.osama@au.edu.iq Zaid O Ibraheem	

8. Course Objectives	
Course Objectives	Enable the student to obtain theoretical and practical information in organic chemistry.
9. Teaching and Learning Strategies	
Strategy	Conveying scientific information to the students using modern scientific methods

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	6	Understanding the structure, reaction an preparation of alkan and cycloalkanes	Alkanes and cycloalka	Lectures	Paper-based exam
4-5	6	Understanding the structure, reaction an preparation of Alken	Alkene	Lectures	Paper-based exam
6	3	Understanding the structure, reaction an preparation of Diene	Diene	Lectures	Paper-based exam
7-8	4	Understanding the structure, reaction an preparation of Alkyn	Alkynes	Lectures	Paper-based exam

9-10	4	Understanding the structure, reaction an preparation of Alcoh	Alcohol	Lectures	Paper-based exam
11-12	3	Understanding the structure, reaction an preparation of Ether	Ether	Lectures	Paper-based exam
13-15	4	Understanding the principle of stereochemistry	Stereochemistry	Lectures	Paper-based exam
1-3	6	Determination of melting point	Determination of melti point	Practical	Lab-based unkno and quiz
4-6	6	Determination of boiling point	Determination of boili Point	Practical	Lab-based unkno and quiz
7-9	6	Solution and filtratio	Solution and filtration	Practical	Lab-based unkno and quiz
10-12	6	Sublimation	Sublimation	Practical	Lab-based unkno and quiz
13-15	6	Simple Distillation	Simple Distillation	Practical	Lab-based unkno and quiz

11. Course Evaluation
• 20 M Theoretical assessment (paper-based midterm exam, attendance) • 20 M Practical assessment (attendance, quizzes, unknows, reports) • 60 M paper-based theoretical final exam
• 100 M total

12. Learning and Teaching Resources	
Required textbooks (curricular book if any)	Morrison RT, Boyd RN. Organic Chemistry. 6th edition ,2008
Main references (sources)	Textbook of organic chemistry for pharmacy students KS Mukheriee
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://books-library.net/free-959800753-download

15.2.2 Medical Physics- Course Description Form

1. Course Name:					
Medical Physics					
2. Course Code:					
PH1812311					
3. Semester / Year:					
2nd Semester/1st year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Theoretical Lectures/Practical Laboratory attendance forum					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 hours theoretical + 2 hours practical (60)/3 units					
7. Course administrator's name					
Theoretical + Practical					
Dr Shatha Mustaffa **drshathamustafa6008@au.edu.iq**					
8. Course Objectives					
Course Objectives Learning the basic concepts of physics and its role in medicine		1. Concepts of basic physics. 2. Application of physics in medical fields. 3. Principles of some medical device working			
9. Teaching and Learning Strategies					
Strategy	Lecturing Reports Quiz				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Thermodynamics system	Explain how to plot graph and make laboratory report	Theoretical lectures & laboratory work	Paper-based exams
2	2	Pressure in medicine	Optical Fiber Loss (bend) Measurement	Theoretical lectures & laboratory work	Paper-based exams
3	2	Temperature in medicine, Heat and energy	Simple pendulum	Theoretical lectures & laboratory work	Paper-based exams

4	2	State of the matter, equation of state	Spectral photometric	Theoretical lectures & laboratory work	Paper-based exams
5	2	Temperature scales (Celsius, Fahrenheit, Kelvin).	Density of liquid	Theoretical lectures & laboratory work	Paper-based exams
6	2	Gas: Kinetic theory of a gas; ideal gas and real gas; general law of gases; clauses equation and Vander Waales equation.	The focal length of convex lens	Theoretical lectures & laboratory work	Paper-based exams
7	2	Gas: Equilibrium and types of equilibrium; compressibility factor, coefficient of volume expansion, elastic coefficient (bulk modulus)	Measurement of Viscosity of liquids	Theoretical lectures & laboratory work	Paper-based exams
8	2	Electromagnetic waves; Maxwell equations; physical optics	Ostwald´s Viscometer: find viscosity of unknown; find the molecular weight; find concentration of unknown substance	Theoretical lectures & laboratory work	Paper-based exams
9	2	Radiation: terms & law (Kirshoffs law; planks law; Stefan-Boltzman law; Wiens law)	Measuring surface tension (by capillary rise method and traveling microscope)	Theoretical lectures & laboratory work	Paper-based exams
10	2	Radiation: Heat transfer (radiation, convection, conduction).	Measuring surface tension (differential height capillary method)	Theoretical lectures & laboratory work	Paper-based exams
11	2	Radiation: X- Ray spectra; absorption of X-Ray		Theoretical lectures & laboratory work	Paper-based exams
12	2	Radiation: U.V and IR effects.	Boyle’s Law	Theoretical lectures	Paper-based exams

15.2.3 Histology -Course Description Form

1. Course Name:
Histology
2. Course Code:
PH1812111
3. Semester / Year:
2nd Semester/1st year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Sheets signed by students
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours Theory + 2 hours Practical/ 3 unites
7. Course administrator's name
Theoretical
Dr Salim Dawood salim.dawwod@au.edu.iqSalim
Practical
Dr Salim Dawood salim.dawwod@au.edu.iqSalim
8. Course Objectives

Course Objective	To study the histological structure of the human body. It is meant primarily to give the student a foundation for advanced study in health care, physiology, pathology, and other fields related to health and fitness. At the end of the course the student should be familiar with the histological description (microanatomy) of the human body (Normal Organs and systems).
9. Teaching and Learning Strategies	
Strategy	Theoretical parts: Lecture in classroom +discussion and oral questions+ Discussion and written question through Google classroom. Practical part: Explain work principles+ Applying the lab examinations + making weekly reports + written and practical quiz.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2	Heart	Circulatory system(hea	Theory& practical	Exam
2	2	Structure of blood vessels	Circulatory	Theory& practical	Exam
3	2	Typing and structure of lymphatic tissues.	Lymphoid tissue	Theory& practical	Exam
4	2	Structure of diffuse lymphatic tissue	Lymphoid	Theory& practical	Exam
5	2	Spinal cord and brain	Central Nervous system	Theory& practical	Exam
6	2	Nerve	Peripheral nervous syst	Theory& practical	Exam
7	2	Lungs respiratory tract	Respiratory system	Theory& practical	Exam
8	2	Structure	Digestive system parts& job	Theory& practical	Exam
9	2	Structure of organs and glands associated with digestive system	Digestive system with glands	Theory& practical	Exam
10	2	Structure of pituitary gland	Endocrine system: pituitary gland	Theory& practical	Exam
11	2	Structure of adrenal thyroid	Endocrine syst Adrenal, Thyr Parathyroid	Theory& practical	Exam
12	2	Structure	Male reproductive syst Excretory genital gland	Theory& practical	Exam
13	2	Structure of ovary and uterus	Female	Theory& practical	Exam
14	2	Structure of kidney urinary tract	Urinary tract system:	Theory& practical	Exam
15	2	Histological structure skin	The skin: Thick & T skin	Theory& practical	Exam

11. Course Evaluation

- 20 M Theoretical assessment;

(paper-based mid-term exam + quiz + attendance)

- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Basic Histology by Luiz Carlos 11th ed. (2005)

15.2.4 Human Anatomy -Course Description Form

1. Course Name:					
Human Anatomy (Theoretical+ Practical)					
2. Course Code:					
PH1812511					
3. Semester / Year:					
2nd Semester/1st year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
1 hours Theoretical + 1 hours Practical (20) /2 units					
7. Course administrator's name					
Theoretical					
Dr emad.mohammed Email: emad.mohammed@au.edu.iq					
Practical					
Dr emad.mohammed Email: emad.mohammed@au.edu.iq					
8. Course Objectives					
Course Objectives Basic knowledge of human anatomy			• The basics of human anatomy, • location,		
9. Teaching and Learning Strategies					
Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations,				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Heart	Circulatory system(hea	Theory& practical	Exam
2	2	Structu of blood re vessels	Circulatory	Theory& practical	Exam
3	2	Typing and structure of lymphatic tissues.	Lymphoid tissue	Theory& practical	Exam
4	2	Structure of diffuse lymphatic tissue	Lymphoid	Theory& practical	Exam
5	2	Spinal cord and brain	Central Nervous system	Theory& practical	Exam
6	2	Nerve	Peripheral nervous syst	Theory& practical	Exam
7	2	Lungs respiratory tract	Respiratory system	Theory& practical	Exam
8	2	Structure	Digestive system parts& job	Theory& practical	Exam
9	2	Structure of organs and glands associated with digestive system	Digestive system with glands	Theory& practical	Exam

10	2	Structure of pituitary gland	Endocrine system: pituitary gland	Theory& practical	Exam
11	2	Structure of adrenal thyroid	Endocrine syst Thyr Adrenal, Parathyroi d	Theory& practical	Exam
12	2	Structure	Male reproductive syst Excretory genital gland	Theory& practical	Exam
13	2	Structu of ovary re and uterus	Female	Theory& practical	Exam
14	2	Structure of kidney urinary tract	Urinary tract system:	Theory& practical	Exam
15	2	Histological structure skin	The skin: Thick & T skin	Theory& practical	Exam

11. Course Evaluation

- 20 M Theoretical assessment;

(paper-based mid-term exam + quiz + attendance)

- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Basic Histology by Luiz Carlos 11th ed. (2005)
	Atlas of Human Histology. By Victor P Eroschenko.10th (2005) & 11th ed. 2008
Main references (sources)	Stevens & Lowe's Human Histology (Fourth Edition) Book • Fourth Edition • 2015 James S. Lowe and Peter G. Anderson
Recommended books and references (scientific journals, reports...)	Basic Histology
Web sites	https://histologyguide.com

15.2.5 Computer Science2-Course Description Form

1. Course Name:
Computer Science 2
2. Course Code:
PH1821511
3. Semester / Year:
1st Semester/ 2nd year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30)/1unit
7. Course administrator's name (mention all, if more than one name)
Dr Aya Salim E mail aya.salim@au.edu.iq

8. Course Objectives	
Course Objectives	In our classroom, students learn the essential computer skills by starting with the us a computer and learning the hardware and physical components that make up a computer syst In addition, the students can create tables, queries, and forms to store and manage data easily using Microsoft Access. Throughout the course, students will be able to use web brows conduct Internet research, store items in the cloud, learn how the networks work, and determ the physical network topology. Finally, we spend time developing the presentation sk by using the existing PowerPoint software as a base for creating presentations.
9. Teaching and Learning Strategies	
Strategy	Quizzes, seminars, practical and theoretical examinations

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2	Presentation skills	Presentation skills	Practical	Practical-based exams and quizzes
2	2	Tutorial			
3	2	Internet	Internet	Practical	Practical-based exams and quizze
4	2	Tutorial			
5	2	Microsoft Access 1	Microsoft Access 1	Practical	Practical-based exams and quizze
6	2	Tutorial			
7	2	Microsoft Access 2	Microsoft Access 2	Practical	Practical-based exams and quizze
8	2	Tutorial			
9	2	Seminar 1			
10	2	Seminar 2			
11	2	Seminar 3			
12	2	Tutorial			
13	2	Cloud computing1	Cloud computing1	Practical	Practical-based exams and quizze
14	2	Cloud computing2	Cloud computing2	Practical	Practical-based exams and quizze
15	2	Tutorial			

11. Course Evaluation

- 40 M practical assessment (attendance + quizzes + practice+ seminar)
- 60 M paper-based theoretical final exam

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books)	Computer Science Textbook 8 Windows 10 & MS Office 2016 by Content Team Orange (Author)
Main references (sources)	Lab. Manual for Practical Computer Science adopted by the department.
Recommended books and references (scientific journals, reports...)	None
Electronic References, Websites	YouTube

15.2.6 English -Course Description Form

1. Course Name:
English (Theoretical)
2. Course Code:
PH1812711
3. Semester / Year:
2nd Semester/1st year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours Theoretical (30 total) /2 units
7. Course administrator's name
Theoretical
.
8. Course Objectives
1. To enable the learner to communicate effectively and appropriately in real life situation. **2.** To use English effectively for study purpose across the curriculum **3.** To develop interest in and appreciation of Literature **4.** To develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking and writing.
9. Teaching and Learning Strategies

Strategy	Lecturing External resources via classroom Seminars Homework Quizzes

10. Course Structure

Week	**Hours**	**Unit or subject name**	**Required Learning Outcomes**	**Learning method**	**Evaluation method**
1	2	Introduction Parts of speech	Introduce the students to the grammar	Theoretical lectures.	Questioning students during the lecture+quiz
2	2	Reading comprehension: Antibiotics What Are Antibiotics?	Helping students to understand the grammar and to read with a correct pronunciation.	Theoretical lectures.	Students presentations
3	2	Sentence structures	To enable learners to construct grammatically correct and	Theoretical lectures.	Questioning students during the lecture+quiz

			meaningful sentences		
4	2	Adjective	Helping students understanding their function and to use them effectively in writing essays and papers.	Theoretical lectures.	Questioning students during the lecture+quiz
5	2	Verb Tenses	To teach the students how to use the correct timing in order to express the right meaning of the sentence.	Theoretical lectures.	Questioning students during the lecture+quiz
6	2	Reading comprehension: Vitamins To Supplement or Not	It teaches the students many skills eg. insightful writing, faster reading, and to learn the meaning of many new words	Theoretical lectures.	Students presentations
7	2	Other English Verb Tenses	To teach the students how to use the correct timing in order to express the right meaning of the sentence.	Theoretical lectures.	Questioning students during the lecture+quiz
8	**Mid-term exam**				
9	2	Modal verbs	To understand the importance of modal verbs in making requests and offers, asking permission, and more.	Theoretical lectures.	Questioning students during the lecture+quiz
10	2	Punctuation Marks	To understand that correct punctuation adds clarity and precision to writing	Theoretical lectures.	Questioning students during the lecture+quiz
11	2	Reading comprehension: Obesity	It teaches the students many skills eg. insightful	Theoretical lectures.	Questioning students during the lecture+quiz

			writing, faster reading, and to learn the meaning of many new words		
12	2	Conditional Sentences	Enable the students to use them correctly in giving advice, expressing regret and discussing facts	Theoretical lectures.	Paper-based exams
13	2	Reading comprehension: health issues that are associated with diet	It teaches the students many skills e.g. insightful writing, faster reading, and to learn the meaning of many new words	Theoretical lectures.	Paper-based exams
14	2	Prepositions	Learning how prepositions can give life to ideas, define relationships, and connect the dots of our thoughts	Theoretical lectures.	Paper-based exams
15	**Final exam**				

11. Course Evaluation

- 30 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance)
- 70 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks	1. English (John and Liz Soars, New Headway Plus, Oxford: Oxford).
Main references (sources)	
Electronic References, Websites	1. https://www.khanacademy.org › humanities › grammar 2. https://learnenglish.britishcouncil.org

16 Second stage-

16.1 Second stage -first semester

16.1.1 Physiology I -Course Description Form

1. Course Name:	
Physiology I (Theoretical+ Practical)	
2. Course Code:	
PH1821311	
3. Semester / Year:	
1st Semester/2nd year	
4. Description Preparation Date:	
1-5-2025	
5. Available Attendance Forms:	
Students' signature on attendance Excel sheets	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 hours Theoretical + 2 hours Practical (75) /4 units	
7. Course administrator's name	
Theoretical	
Dr Basman Qassim Shareef Basmanshareef24@gmail.com	
Practical	
Lecturer :- Ahmad Ibrahim ahmed. Ibrahim@au.edu.iq	
8. Course Objectives	
Course Objectives	Enable students to acquire basic knowledge regarding the functions of the normal body, along with the ability to assess these functions and their relationship to normal and pathological conditions. Additionally, this course aids students in understanding the importance of molecular, biochemical, and cellular mechanisms in maintaining the internal environment stability of the body.
9. Teaching and Learning Strategies	
Strategy	• Lectures and Interactive Presentations • Case-Based Learning

- Interactive Workshops and Seminars
- Self-Directed Learning and Research Projects
- Assessment Strategies
- Practical laboratory demonstrations of physiological investigations and experiments in different subjects of physiology.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	3+2	Acquired Medical Physiology Knowledge	Physiology of nerves: Nerve cells; excitation and conduction; Properties of mixed nerves; glia; neurotrophins; Nerve fiber types and functions	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	Acquired Medical Physiology Knowledge	central regulation of visceral function; the autonomic nervous system	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	Acquired Medical Physiology Knowledge	Synaptic transmission: Reflexes; cutaneous, deep and visceral sensations	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	Acquired Medical Physiology Knowledge	Motor system	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	Acquired Medical Physiology Knowledge	Alert behavior, sleep and electrical activity of the brain; control of posture and movement	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	Acquired Medical Physiology Knowledge	Higher function of the nervous system	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	Acquired Medical Physiology Knowledge	Nervous system disorders can be explained in molecular terms	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	Mid-term exam				
9	3+2	Acquired Medical Physiology Knowledge	cardiac arrhythmias; electrographic findings in cardiac diseases; mechanical events of the	Theoretical lectures.	Paper-based exams
			cardiac cycle; cardiac output;	Laboratory demonstration.	
10	3+2	Acquired Medical Physiology Knowledge	cardiovascular regulatory mechanisms: Local regulatory mechanisms; systemic regulation by the nervous system; systemic regulation by hormones;	Theoretical lectures. Laboratory demonstration.	Paper-based exams

11	3+2	Acquired Medical Physiology Knowledge	Respiration: Respiratory zones; Mechanics of respiration; air volumes; respiratory muscles; compliance of the lungs and chest wall; surfactants; differences in ventilation and blood flow in different parts of the lung	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	Acquired Medical Physiology Knowledge	Dead space and uneven ventilation; Pulmonary circulation: Pressure, volume, and flow. Gas transport between the lungs and tissue; Regulation of respiration: Neural control of breathing; Respiratory centers; Regulation of respiratory activity: Chemical factors; non chemical factors	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	Acquired Medical Physiology Knowledge	Introduction; innervations of the renal vessels; renal clearance; renal blood flow; glomerular filtration rate (GFR): Measurements; factor affecting GFR; Filtration fraction; reabsorption of Na+, Cl – and glucose. Tubuloglomerular feedback and glomerulotubular balance; water excretion in: proximal tubules; loop of henle; distal tubules; collecting ducts	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	Acquired Medical Physiology Knowledge	the counter current mechanism; role of urea; water diuresis and osmotic diuresis; acidification of the urine: H+ secretion; reaction with buffers; ammonia secretion; factors	Theoretical lectures. Laboratory demonstration.	Paper-based exams

			affecting acid secretion; bicarbonate execration; regulation of Na+, K+ and Cl – excretion		
15	Students' seminars				

11. Course Evaluation
• 25 M Theoretical assessment; (paper-based mid-term exam + quiz) • 25 M practical assessment (attendance + quiz + + seminars) • 50 M paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources	
Required textbooks	• Textbook of Medical Physiology by Guyton AC; latest edition
Main references (sources)	• Vander_s Human Physiology; latest edition • Ganong's review of medical physiology; latest edition
Electronic References, Websites	• PubMed (https://pubmed.ncbi.nlm.nih.gov/) • Physiology Online (https://www.physiologyonline.org/) • PhysiologyWeb (https://www.physiologyweb.com/)

16.1.2 Physical pharmacy I -Course Description Form

1. Course Name:					
Physical pharmacy I (Theoretical+ Practical)					
2. Course Code:					
PH1821111					
3. Semester / Year:					
1st Semester/2nd year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 hours Theoretical + 2 hours Practical (75) /4 units					
7. Course administrator's name					
Theoretical					
Ilaf Gabar ilaf.jabbar@au.edu.iq Ali Mazin Am428057@gmail.com					
Practical					
Ilaf Gabar ilaf.jabbar@au.edu.iq Ali Mazin Am428057@gmail.com					
8. Course Objectives					
Course Objective	• Learning the physical principles that guide the pharmaceutical dos form. • Understanding the basis of solubility, kinetics and drug delivery.				
9. Teaching and Learning Strategies					
Strategy	Lecturing Seminars Homework Practical laboratory demonstrations and team lab work				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	. Understand the nature of the intra- and intermolecular forces that are involved in stabilizing molecular and physical structures. . Understand the differences in these forces and their relevance to different types of molecules.	States of matter, binding forces between molecules.	Theoretical lectures. Laboratory experiments	Paper-based exams

		3.Appreciate the differences in the strengths of the intermolecular forces that are responsible for the stability of structures in the different states of matter.			
2	3+2	. Understand the properties of the different states of matter. . Describe the pharmaceutical relevance of the different states of matter to drug delivery systems by reference to specific examples given in the text boxes. . Describe the solid state, crystallinity, solvates, polymorphism.	Ggases, liquids, s and crystalline matte	Theoretical lectures. Laboratory experiments	Paper-based exams
3	3+2	.Understand phase equilibria and phase transitions between the three main states of matter. .Understand the phase rule and its application to different systems containing multiple components.	phase	Theoretical lectures. Laboratory experiments	Paper-based exams
4	3+2	.Understand the theory of thermodynamics and its use for describing energy-related changes in reactions. .Understand the first law of thermodynamics and its use.	Thermodynamics, f law, thermochemis second law, third l free energy funct and applications	Theoretical lectures. Laboratory experiments	Paper-based exams

5	3+2	1.Understand the second law of thermodynamics and its use. 2.Understand the third law of thermodynamics and its use. 3.Define and calculate free energy functions and apply them to pharmaceutically relevant issues.	Thermodynamics, f law, thermochemis second law, third l free energy funct and applications	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	.Identify and describe the four colligative properties of nonelectrolytes in solution. 2.Understand the various types of pharmaceutical solutions.	Solutions of non-electrolytes, properti	Theoretical lectures. Laboratory experiments	Paper-based exams
7	3+2	.Define ideal and real solutions using Raoult's and Henry's laws. 2.Calculate vapor pressure lowering, boiling point elevation, freezing point lowering, and pressure for solutions of nonelectrolytes.	ideal and real colligative propertie molecular weight determination	Theoretical lectures. Laboratory experiments	Paper-based exams
8	Mid-term exam				
9	3+2	.Understand the important properties of solutions of electrolytes. 2.Calculate the conductance of solutions, the equivalent conductance,	Solution of electrolytes, properti	Theoretical lectures. Laboratory experiments.	Paper-based exams

16.1.3 Organic Chemistry II -Course Description Form

1. Course Name:					
Organic Chemistry II					
2. Course Code:					
PH1821211					
3. Semester / Year:					
1st Semester, 2nd year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 hours Theoretical + 2 hours Practical /3 units					
7. Course administrator's name					
Theoretical					
Dr Mustaffa Jawad Mustafa.jwad@au.edu.iq Dr Sara Omar sarah.omerahmed@au.edu.iq					
Practical					
Dr Sara Omar sarah.omerahmed@au.edu.iq					
8. Course Objectives					
Enable the student to obtain theoretical and practical information in organic chemistry.					
9. Teaching and Learning Strategies					
Lecturing, Homework, Quiz, Practical laboratory					
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-4		Aromatic compounds	Nomenclature, Reactions and synthesis	Lectures	Paper-based exams
5	3	Arenas and their derivativ	Nomenclature, Reactions and synthesis	lectures.	

					Paper-based exams
6	3	Phenols	Nomenclature, Reactions and synthesis	lectures.	Paper-based exams
7-9	3	Amines	classification , nomenclature reaction and synthesis	lectures.	Paper-based exams
10-12	3	aldehydes and ketones	nomenclature , reaction and synthesis	lectures.	Paper-based exams
13-14	3	Carboxylic acid	Nomenclature, Reactions and synthesis	lectures.	Paper-based exams
15	3	Derivatives of Carboxylic acid	Nomenclature, Reactions and synthesis	lectures.	Paper-based exams
Practical					
1	2	Introduction of practical organic chemistry	Introduction	Practical	Lab-based unkno wn and quiz
2-3	2	Solubility	Solubility classes and unkno	Practical	Lab-based unkno wn and quiz
4-6	2	alcohols	Identification of alcohols unknown	Practical	Lab-based unkno wn and quiz
7-9	2	phenols	Identification and unknown	Practical	Lab-based unkno wn and quiz
10-11	2	amines	Identification and unknown	Practical	Lab-based unkno wn and quiz
12-14	2	aldehyde and ketone	Identification and unknown	Practical	Lab-based unkno wn and quiz

16.1.4 Medical Microbiology I -Course Description Form

1. Course Name:	
Medical Microbiology I (Theoretical+ Practical)	
2. Course Code:	
PH1821411	
3. Semester / Year:	
1st Semester/2nd year	
4. Description Preparation Date:	
1-5-2025	
5. Available Attendance Forms:	
Students' signature on attendance sheet	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 hours Theoretical + 2 hours Practical (75 total) /4 units	
7. Course administrator's name	
Theoretical	
Dr Haneen Subhi Haneen.subhi@au.edu.iq	
Practical	
Dr Haneen Subhi Haneen.subhi@au.edu.iq	
8. Course Objectives	
Course Objectives Identify the most common pathogenic bacteria, Knowing mode of transmission, Virulence factors, Pathogenesis and clinical significance Diagnosis, Treatment and Prevention	• The basics of bacteria in terms of sha composition, dyes, cultivati microscopic phenomena. • The identification and genetics proc of bacteria, in addition to sensiti testing,
9. Teaching and Learning Strategies	
Strategy	Lecturing External resources via classroom Seminars Homework Quiz Practical laboratory demonstrations, microscopic slides and Lab book catalogu

10.		Course Structure			
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Importance and History of Microbiology Anatomy of bacteria: Cell wall of Gram positive &Gram negative bacteria	Introduction to Medical Microbiology	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	Bacterial physiology: growth curve and bacterial reproduction. Bacterial genetics	Introduction Medical Microbiology	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	Recombinant DNA biotechnology Sporulation and germination	Introduction Medical Microbiology	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	Sterilization (chemical + physical Methods) Chemotherapy	Introduction Medical Microbiology	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	Morphology of Bacteria. Staining and Classification. Normal flora and pathogenicity	Introduction Medical Microbiology	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	Staphylococcus species Streptococcus pyogenes Streptococcus pneumoniae	Systemic medical microbiology: Gram positive bacteria	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	Non spore forming C. diphtheriae Spore-forming bacteria Bacillus species (B. anthracis, B. subtilis, B. cereus). Clostridium species	Systemic medical microbiology: Gram positive bacteria	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	Mid-term exam				
9	3+2	Propionibacterium acnes, Listeria	Systemic medical microbiology:	Theoretical lectures.	Paper-based exams

			Gram positive bacteria	Laboratory demonstration.	
10	3+2	Mycobacterium tuberculosis; M. leprae Actinomycetes Nocardia Chlamyadiae	Systemic medical microbiology: Gram positive bacteria	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	Identification & classification of Gram negative bacteria Enterobacteriaceae: E. coli; Klebsiella species .; Citrobacter , Sertalia, Hafmia, Enterobacter	Systemic medical microbiology: Gram negative bacteria	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	Shigella species; Salmonella species; Proteus species, Pseudomonas species	Systemic medical microbiology: Gram negative bacteria	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	Vibrio Cholerae; Brucella species ; Haemophilus species ; Campylobacter species .	Systemic medical microbiology: Gram negative bacteria	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	Helicobacter species ; Bordetella pertussis; Treponema pallidum (Spirochetes);Yersinia pestis; Pasteurella multicidae.	Systemic medical microbiology: Gram negative bacteria	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	Students' seminars				
11. Course Evaluation					
• 20 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance + seminar) • 20 M practical assessment (attendance + quiz + practice) • 60 M paper-based theoretical final exam 100 M total					
12. Learning and Teaching Resources					
Required textbooks	1. Brooks GF, Carroll KC, Butel JS, Morse SA. Jawetz, Melnick, and Adelberg's Medical Microbiology, 24th edition, MCGraw-Hill,2007.				

	2. Brwn AE. Bensonn's Microbiological Application, MCGraw-Hill.
Main references (sources)	1. Hugo and Russell's - Pharmaceut Microbiology 8th edition 2. Lippincott illustrated rev microbiology 2nd ed. By Harvey
Electronic References, Websites	https://www.who.int/ https://www.cdc.gov/index.htm

16.1.5 Computer Science 3-Course Description Form

1. Course Name:	
Computer Science 3	
2. Course Code:	
PH1821511	
3. Semester / Year:	
1st Semester/ 2nd year	
4. Description Preparation Date:	
1-5-2025	
5. Available Attendance Forms:	
Students' signature on attendance sheet	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours per week (30)/1unit	
7. Course administrator's name (mention all, if more than one name)	
Assistant lecturer :- aya.salim Aya.salim@au.edu.iq	
8. Course Objectives	
Course Objectives	In our classroom, students learn the essential computer skills by starting with the us a computer and learning the hardware and physical components that make up a computer syst In addition, the students can create tables, queries, and forms to store and manage data easily using Microsoft Access. Throughout the course, students will be able to use web brows conduct Internet research, store items in the cloud, learn how the networks work, and determ the physical network topology. Finally, we spend time developing the presentation sk by using the existing PowerPoint software as a base for creating presentations.
9. Teaching and Learning Strategies	
Strategy	Quizzes, seminars, practical and theoretical examinations

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2	Presentation skills	Presentation skills	Practical	Practical-based exams and quizzes
2	2	Tutorial			
3	2	Internet	Internet	Practical	Practical-based exams and quizze
4	2	Tutorial			
5	2	Microsoft Access 1	Microsoft Access 1	Practical	Practical-based exams and quizze
6	2	Tutorial			
7	2	Microsoft Access 2	Microsoft Access 2	Practical	Practical-based exams and quizze
8	2	Tutorial			
9	2	Seminar 1			
10	2	Seminar 2			
11	2	Seminar 3			
12	2	Tutorial			
13	2	Cloud computing1	Cloud computing1	Practical	Practical-based exams and quizze
14	2	Cloud computing2	Cloud computing2	Practical	Practical-based exams and quizze
15	2	Tutorial			

11. Course Evaluation

- 40 M practical assessment (attendance + quizzes + practice+ seminar)
- 60 M paper-based theoretical final exam

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books)	Computer Science Textbook 8 Windows 10 & MS Office 2016 by Content Team Orange (Author)
Main references (sources)	Lab. Manual for Practical Computer Science adopted by the department.
Recommended books and references (scientific journals, reports...)	None
Electronic References, Websites	YouTube

16.2 Second stage – second semester

16.2.1 Physiology II ـCourse Description Form

1. Course Name:					
Physiology II (Theoretical+ Practical)					
2. Course Code:					
PH1823311					
3. Semester / Year:					
2nd Semester/2nd year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 hours Theoretical + 2 hours Practical (75) /4 units					
7. Course administrator's name					
Theoretical					
Dr Basman Shareef Qassim E mail Basmanshareef24@gmail .com					
Practical					
Lecturer Ahmad Ibrahim ahmed.ibrahim@au.edu.iq					
8. Course Objectives					
Course Objectives The course identifies the basic knowledge ab the physiology of Circulatory body fl Endocrinology and Gastrointestinal system.		This course enables the students to understand principles			
9. Teaching and Learning Strategies					
Strategy	Lecturing Seminars Quiz Practical laboratory demonstrations of physiological investigations and experiments in different subjects of physiology.				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Circulatory body fluid: Introduction; blood; bone marrow	Physiology of circulatory body flu	Theoretical lectures Laboratory experiments	Paper-based exams
2	3+2	White blood cells; immunity; Platelets; red blood cells;	Physiology of circulatory body flu	Theoretical lectures Laboratory demonstration.	Paper-based exams

3	3+2	Anemia; polycythemia Blood group and Rh factor; hemostasis:	Physiology of circulatory body flu	Theoretical lectures Laboratory demonstration	Paper-based exams
4	3+2	The clotting mechanism / blood coagulation tests Anti-clotting mechanism; the plasma	Physiology of circulatory body flu	Theoretical lectures Laboratory demonstration	Paper-based exams
5	3+2	The lymph; abnormalities of hemostasis	Physiology of circulatory body flu	Theoretical lectures Laboratory experiments	Paper-based exams
6	3+2	Digestion and absorption of carbohydrates; proteins; lipids; absorption of water and electrolytes; vitamins and minerals	Physiology of Gastrointestinal system	Theoretical lectures Laboratory demonstration	Paper-based exams
7	3+2	Regulation of gastrointestinal function: Introduction; gastrointestinal hormones; mouth and esophagus; stomach	Physiology of Gastrointestinal system	Theoretical lectures Laboratory demonstration	Paper-based exams
8	Mid-term exam				
9	3+2	Exocrine portion of the pancreas; liver and biliary system; small intestine; colon	Physiology of Gastrointestinal system I	Theoretical lectures. Laboratory demonstration.	Paper-based exams
	3+2	Introduction; energy balance, metabolism and nutrition; the pituitary gland	Endocrinology	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	The thyroid gland	Endocrinology	Theoretical lectures Laboratory demonstration	Paper-based exams
12	3+2	The gonads: development and function of the male reproductive system	Endocrinology	Theoretical lectures Laboratory demonstration	Paper-based exams
13	3+2	The gonads: development and function of the female reproductive system	Endocrinology	Theoretical lectures Laboratory demonstration	Paper-based exams

14	3+2	Endocrine functions of the pancreas and regulation of carbohydrate metabolism	Endocrinology	Theoretical lectures Laboratory demonstration	Paper-based exams
15	Students' seminars				
11. Course Evaluation					
• 25 M Theoretical assessment; (paper-based mid-term exam + quiz) • 25 M practical assessment (attendance + quiz + + seminars) • 50 M paper-based theoretical final exam 100 M total					
12. Learning and Teaching Resources					
Required textbooks			Textbook of Medical Physiology by Guyton AC; latest edition		
Main references (sources)			• Vander_s Human Physiology; latest editi • Ganong's review of medical physiolo latest edition		
Electronic References, Websites			https://youtu.be/qghzLR5JUBE		

16.2.2 Organic Chemistry III -Course Description Form

1. Course Name:
Organic Chemistry III
2. Course Code:
01 2 042
3. Semester / Year:
2nd Semester, 2nd year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signatures on attendance sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours theory + 2 hours practical (60) / 3 units
7. Course administrator's name (mention all, if more than one name)
Theory
Assistant Lecturer:- Mustaffa Jawad Mustafa.jwad@au.edu.iq
Practical
Dr Sara Omar E mail sarah.omerahmed@au.edu.iq
8. Course Objectives
The student obtains theoretical and practical information about heterocyclic compounds.
9. Teaching and Learning Strategies
Study of the nomenclature, reactions, and preparation of five- and six-ring heterocyclic compou such as pyridine, pyrrole, furan, and thiophene, in addition to heterocyclic rings containing two or m heteroatoms and some fused heterocyclic compounds such as, indole, isoindole, quinoline isoquinoline.
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	4	Classes of heterocyclic syste heterocyclic rings (epoxide	Introduction of heterocyc se compounds	Lectures om rocyclic c	Paper-based exams
3-4	4	Nomenclature of heterocycl compounds	Nomenclature of heterocyclic compounds	Lectures	Paper-based exams
5	2	Properties and occurrence i nature and in medicinal products	Properties and occurrenc in nature and in Medicinal products	Lectures	Paper-based exams

6-7	4	Five-membered ring heterocyclic compounds (pyrrole, furan and Thiophe and benzo[b]pyrrole (Indole	Five-membered ring heterocyclic compounds	Lectures	Paper-based exams
8	2	Source of Five-membered r heterocyclic compounds (pyrrole, furan, Thiophene)	Source of (pyrrole, furan Thiophene)	Lectures	Paper-based exams
9-10	4	Electrophilic substitution re orientation of Pyrrole, furan,	Reactions of pyrrole, fur Thiophene	Lectures	Paper-based exams
11	2	Saturated five-membered heterocyclic rings with one heteroatom (pyrrolidine tetrahydrofuran and tetrahydrothiophen) .	Saturated five-membered heterocyclic rings	Lectures	Paper-based exams
12-13	4	Six-membered ring heterocyclic compounds, structure, source and basicit of pyridine.	structure, source and basicity of pyridine.	Lectures	Paper-based exams
14-15	4	reactions of pyridine and benzopyridines (Quinoline and isoquinoline	reactions of pyridine and benzopyridines	Lectures	Paper-based exams
1-3	6	Introduction of practical organic chemistry	Introduction of practical organic chemistry	Practical	Lab-based unknown and quiz
4-5	4	Identification of alkyl and a halides	Identification of alkyl an aryl halides	Practical	Lab-based unknown and quiz
6	2	Unknown of alkyl and aryl halides	Unknown of alkyl and ar halides	Practical	Lab-based unknown and quiz
7-8	4	Identification of carboxylic acid salts	Identification of carboxy acid salts	Practical	Lab-based unknown and quiz
9	2	Unknown of carboxylic aci salts	Unknown of carboxylic acid salts	Practical	Lab-based unknown and quiz
10-11	4	Identification of carboxylic acid	Identification of carboxy acid	Practical	Lab-based unknown and quiz
12-13	4	Synthesis of thiopyrimidine	Synthesis of thiopyrimidi	Practical	Lab-based unknown and quiz
14-15	4	Synthesis of benzoimidazol	Synthesis of benzoimidazole	Practical	Lab-based unknown and quiz

11. Course Evaluation
• 20% Theoretical assessment (paper-based midterm exam, attendance) • 20% Practical assessment (attendance, quizzes, unknows, reports) • 60% paper-based theoretical final exam
• 100 M total

actions, reactivity and Thiophene.

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Morrison RT, Boyd RN. Organic Chemistry. 6th edition ,2008
Main references (sources)	Textbook of organic chemistry for pharmacy students KS Mukheriee
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://books-library.net/free-959800753-download

16.2.3 Medical Microbiology II Course Description Form

1. Course Name:					
Medical Microbiology II					
2. Course Code:					
PH1823411					
3. Semester / Year:					
2nd semester/2nd year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Sheets signed by students					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 hours Theory + 2 hours Practical (75)/ 4 unites					
7. Course administrator's name (mention all, if more than one name)					
Theoretical					
Dr Haneen Subhi haneen.subhee@au.edu.iq					
Practical					
Dr Haneen Subhi haneen.subhee@au.edu.iq					
8. Course Objectives					
Course Objectives	• Give the student the most important information about the • Parasitic diseases mostly in Iraq& their transmission. • Also studying viruses and the most important groups of viruses associated human pathogenicity. • The course also include immune session which give the student information about innate and adaptive immune response and immune disorders and diseases. • This course also enables the students to understand the principles of innate and adaptive immunity and Studying most diseases deal with immunity as well as auto-immune diseases, different defense mechanism.				
9. Teaching and Learning Strategies					
Strategy	**Theoretical parts**: Lecture in classroom +discussion and oral questions+ Discussion and written question through Google classroom. **Practical part**: Explain work principles+ Applying the lab examinations + making weekly reports + written and practical quiz.				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Learning what is parasites and parasitism	Introduction to Parasitology and classification	Theory& practical	Exam
2	3+2	About	Protozoa: Pathogenic	Theory& practical	Exam

3	3+2	About nonpathogenic intestinal amoeba and free living opportunistic amoeba.	Cont. Commensal amoeba and diseases caused by f living amoeba.	Theory& practical	Exam
4	3+2	About endemic intestinal and luminal flagellates.	Flagellates of GIT and reproductive system. Ciliates (Balantidium coli)	Theory & practical	Exam
5	3+2	About endemic blood flagellates	Flagellates of blood and tissues (Leishmania)	Theory & practical	Exam
6	3+2	About flagellate that cause sleeping sickness.	Flagellates of blood and tissu Trypanosoma)	Theory & practical	Exam
7	3+2	About malaria parasites	Protozoa: Haemosporidia (Plasmodi spp.)	Theory & practical	Exam
8	3+2	About the most Endemic cat parasite	*Toxoplasma gondii*) Protozoa: Coccidia	Theory & practical	Exam
9	3+2	About the cattle tape worm, s, big tapeworm and dwarf tapeworm.	- Helminthes classification - Cestodes (Taenias Hymenolepis nana)	Theory & practical	Exam
10	3+2	About tape worm causing hydatid disease	Cont. Echinococcus spp.	Theory & practical	Exam
11	3+2	About Bilharzia	Trematodes: Schistosoma sp	Theory & practical	Exam
12	3+2	About upper GIT nematodes	Nematodes (Asca Hookworms)	Theory & practical	Exam
13	3+2	About lower GIT nematodes	Cont. Enterobius, Trichuris	Theory & practical	Exam
1	3	Virus	Introduction to Virology general characters	Theory	Exam
2	3	Virus proliferation identification	Reproduction and isolate methods for viruses	Theory	Exam
3	3	Virus treatment	Anti-viral therapy and interaction	Theory	Exam
4	3	Virus groups	Classification of viruses	Theory	Exam
5	3	The most endemic viral groups that have DNA	DNA viruses: HERPESVIRIDAE (HSV1&2, Varicella Zost HV4,5,6,7,8), POXVIRIDAE(human disease), ADENOVIRIDAE(adeno disease), PAPOVIRIDAE(HPV and its different typ HEPADNAVIRIDAE (HBV, PARVOVIRIDAE(B19)	Theory	Exam

6	3	The most endemic viral groups that have RNA	RNA viruses: Enveloped Segmented Single-Stranded RNA Viruses (Influenza A,B,C), Enveloped Nonsegmented ssRNA Viruses (parainfluenza, mumps virus, measles virus, RSV), Rhabdovirus family; genusLyssavirus (Rabies), Flavivirus, ssRNA +ve sense (HCV), HIV, Nonenveloped NonsegmentedssRNA Viruses: Picornaviruses andCaliciviruses (PicornavirusesHAV), Nonenveloped SegmenteddsRNA Viruses:Reoviruses (rota & reo), Prions and Spongiform Encephalopathies	Theory	Exam
1	3	Immune response mechanisms in human body: innate immunity	Innate immune response: Describe the characteristics of innate immunity,	Theory	Exam

			Describe physical and chemical immune barriers, *explain immediate and induced innate immune responses, *discuss natural killer cells, *describemajor histocompatibility class I, II molecules, *how the proteins in complement system function to destruct extracellular pathogens		
2	3	The role of cytokine immune system	Cytokines: Properties of cytokines Biological functions of cytokines Cytokines family	Theory	Exam
3	3	Immune response mechanisms in human	Adaptive immune response: Describe the characteristics •describe the formation of B and T cells, •discuss humoral immunity (How B cells function), •explain cell mediated immunity (T cell types and functioning), •Summarize how the cells work together for an adaptive immune response	Theory	Exam
4	3	About structure and mechanism of action of antibodies	Antibodies characteristics features: *Distinguish between the overall structure and the fine structure of antibodies * Describe the variable and constant regions of an antibody's light and heavy chains.	Theory	Exam

			*Name and compare the biological and chemical characteristics of the five classes of antibodies. *Contrast monoclonal antibodies.		
5	3	Understanding hypersensitivity reactions considering mechanisms and effects	Hypersensitivity reactions: *Classification of hypersensitivity types with respect to the participating immune effectors and mechanisms of tissue damage. *Understand how normal T cell and B cell antigen recognition, signaling, and effector hypersensitivity. *Recognize the common clinical manifestants of the 4 types of hypersensitivity.	Theory	Exam
6	3	Understanding tum and their relation with immune system	Tumor immunology: *Understand how the immune system mounts an immune response against tumors *Understand how tumors evade immunity	Theory	Exam
7	3	What do we mean by autoimmune disease	Autoimmune Diseases: *Understand how differ autoimmune diseases driven by the recognition different autoantigens	Theory	Exam

11. Course Evaluation
• 40 M practical assessment (attendance + quizzes + practice+ seminar) • 60 M paper-based theoretical final exam • 100 M total

16.2.4 Computer Sciences 4-Course Description Form

1. Course Name:
Computer Sciences 4
2. Course Code:
PH1823611
3. Semester / Year:
2nd Semester/ 2nd year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30)/1 unit
7. Course administrator's name (mention all, if more than one name)
Assistant Lecturer :- Aya Salim aya.salim@au.edu.iq

8. Course Objectives	
Course Objectives	In our classroom, students learn the essential computer skills by starting with the us a computer and learning the hardware and physical components that make up a computer syst In addition, the students can create tables, queries, and forms to store and manage data easily using Microsoft Access. Throughout the course, students will be able to use web brows conduct Internet research, store items in the cloud, learn how the networks work, and determ the physical network topology. Finally, we spend time developing the presentation sk by using the existing PowerPoint software as a base for creating presentations.
9. Teaching and Learning Strategies	
Strategy	Quizzes, seminars, practical and theoretical examinations

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	Data communications	Data communications	Practical	Practical-based

					Exams and quizzes
2	2	Recording a video presentation with Zoom and PPT slides	Recording a vi presentation w Zoom and PPT sli	Practical	Practical-based Exams quizzes
3	2	cloud storage	cloud storage	Practical	Practical-based Exams quizzes
4	2	Tutorial			
5	2	Physical storage	Physical storage	Practical	Practical-based Exams quizzes
6	2	Tutorial			
7	2	Video recorder for mobil	Video record er mobile	Practical	Practical-based Exams quizzes
8	2	SPSS1	SPSS1	Practical	Practical-based Exams quizzes
9	2	Tutorial			
10	2	SPSS2	SPSS2	Practical	Practical-based Exams quizzes
11	2	Tutorial			
12	2	SPSS3	SPSS3	Practical	Practical-based Exams quizzes
13	2	Tutorial			
14	2	SPSS4	SPSS4	Practical	Practical-based Exams quizzes
15	2	Tutorial			

11. Course Evaluation

- 40 M practical assessment (attendance + quizzes + practice+ seminar)
- 60 M paper-based theoretical final exam

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books)	Computer Science Textbook 8 Windows 10 & MS Office 2016 by Content Team Orange (Author)
Main references (sources)	Lab. Manual for Practical Computer Science adopted by the department.
Recommended books and references (scientific journals, reports...)	None
Electronic References, Websites	YouTube

Third year – first semester

Course Description Form

1. Course Name:	
Biochemistry I (theoretical and practical)	
2. Course Code:	
013041	
3. Semester / Year:	
1st Semester / 3rd year	
4. Description Preparation Date:	
01/09/2025	
5. Available Attendance Forms:	
Students' signature on attendance sheet	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 hours Theoretical + 2 hours Practical (75) /4 units	
7. Course administrator's name	
Theoretical	
Lectrurer :- Rana Khudair Gasem	
Practical	
Assistant lecturer :- Sara Salah	
8. Course Objectives	
Course Objectives The course teaches the basics of biochemistry establish the foundations of essential metabolites macromolecules.	- Amino acids, peptides, proteins, f nucleic acids, as well as carbohydrate - Essentials of enzymes, their names, t mechanism - Plasma membrane, the mechanism action of hormones and t classification - The basics of clinical nutrition
9. Teaching and Learning Strategies	
Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations, microscopic slides and Lab book catalogue
10.	Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Definitions and terms; proteins, enzymes, DNA; Clinical value	Introduction to the macromolecules in biochemistry	Theoretical lectures Laboratory experiments	Paper-based exa
2	3+2	Structures of amino acids (table of standard amino acids abbreviation and side chain); Classification, properties, isomerism	Amino acids	Theoretical lectures Laboratory demonstration	Paper-based exa
3	3+2	Chemical reactions, Zwitter ions, titration curve calculating isoelectric point values. Examples and questions. Non standards A.A: Structures, existence and clinical value	Amino acids	Theoretical lectures Laboratory demonstration	Paper-based exa
4	3+2	Peptide bond, resonance forms, isomers, physical properties and chemical reactions. Essential poly peptides in human body, structures, roles and clinical values	Peptides	Theoretical lectures Laboratory demonstration	Paper-based exa
5	3+2	Structure and conformations of proteins, Primary structure, Secondary structure (α helix, β sheet), tertiary structure, quaternary structure. Classification, synthesis, cellular functions (Enzymes, cell signaling, and ligand transport, structural proteins), protein in nutrition	Proteins	Theoretical lectures Laboratory experiments	Paper-based exa
6	3+2	Determining amino acids composition, N- terminal amino acid analysis, C-terminal A.A analysis, Edman	Denaturation of proteins and protei sequencing	Theoretical lectures Laboratory demonstration	Paper-based exa

		degradation, prediction protein sequence from DNA/ RNA sequences. Methods of protein study: Protein purification, cellular localization, proteomics and bioinformatics, structure predication and simulation			
7	3+2	Chemistry and classification, biomedical importance, classification of CHO, Stereochemistry of monosaccharides, metabolism of CHO; Physiologically important monosaccharides, glycosides, disaccharides, polysaccharides	Carbohydrates	Theoretical lectures Laboratory demonstration	Paper-based exa
8	Mid-term exam				
9	3+2	Introduction, classification of lipids, fatty acids (F.A), nomenclature of F.A, saturated F.A, unsaturated F.A, physical and physiological properties of F.A, metabolism of lipids. Phospholipids, lipid peroxidation and antioxidants, separation and identification of lipids, amphipathic lipids	Lipids	Theoretical lectures Laboratory demonstration	Paper-based exa
10	3+2	Structures and mechanism, nomenclature, classification, mechanisms of catalysis, thermodynamics,	Enzymes	Theoretical lectures Laboratory demonstration	Paper-based exa

		specificity, lock and key model, induced fit model, transition state stabilization, dynamics and function, allosteric modulation. Biological function, cofactors, coenzymes, involvement in disease			
11	3+2	General principles, factors effecting enzyme rates (substrate conc., pH, temperature, etc), single-substrate reaction (Michaelis- Menten kinetics), kinetic constants. Examples of kinetic questions and solutions.	Kinetics	Theoretical lectures Laboratory demonstration	Paper-based exa
12	3+2	Reversible inhibitors, competitive and non-competitive inhibition, mixed-type inhibition, Irreversible inhibition. Inhibition kinetics and binding affinities (*ki*), questions and solutions	Enzyme inhibition	Theoretical lectures Laboratory demonstration	Paper-based exa
13	3+2	multi-substrate reactions, ternary- complex mechanisms, ping-pong mechanisms, non-Michaelis-Menten kinetics, pre-steady- state kinetics, chemical mechanisms	Enzymes: Control activity and uses o inactivators	Theoretical lectures Laboratory demonstration	Paper-based exa
14	3+2	Chemical structure, nucleic acid components, nucleic acid bases, nucleotides and deoxynucleotides (Properties, base pairing, sense and antisense, super-	Nucleic Acid: Biological functio of DNA	Theoretical lectures Laboratory demonstration	Paper-based exa

		coiling, alternative structures, quadruple structures, Genes and genomes, transcription and translation, replication			
15		Plasma membrane structure and function; Biomedical importance, membrane proteins associated with lipid bilayer, membranes protein composition, dynamic structures of membranes, asymmetric structures of membranes, Artificial membranes model, the fluid mosaic model, membrane selectivity, physiological functions of plasma membranes	Biochemistry of extracellular and intracellular communication	Theoretical lectures Laboratory demonstration	Paper-based exa
16		Classification of hormones, biomedical importance, the target cell concept and hormone receptors, biochemistry of hormone signal transduction	Biochemistry of th endocrine system	Theoretical lectures Laboratory demonstration	
17		Biomedical importance, digestion and absorption of carbohydrates, lipids, proteins, vitamins and minerals; energy balance. Biochemistry of hemostasis and clot formation	Nutrition, digestio and absorption	Theoretical lectures Laboratory demonstration	Paper-based exa
18	Students' seminars				
11. Course Evaluation					
• 20 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance + seminar) • 20 M practical assessment (attendance + quiz + practice) • 60 M paper-based theoretical final exam 100 M total					

Course Description Form

1. Course Name:
Inorganic Pharmaceutical Chemistry
2. Course Code:
01 3 010
3. Semester / Year:
1st Semester/3rd Year
4. Description Preparation Date:
24/03/2025
5. Available Attendance Forms:
Students' signatures on attendance sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours theory + 2 hours practical (60) / 3 units
7. Course administrator's name (mention all, if more than one name)
Theory
Assosciate prof :- Mohammad Udai
Practical

8. Course Objectives	
Course Objectives	• Introducing the students to atoms and elements • Explaining the role of inorganic products in pharmacy
9. Teaching and Learning Strategies	
Strategy	• Theory lectures with teaching aids such as videos and diagrams • Practical sessions where students actively perform experiments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	6	• Understanding the structure of atomsand molecules	• Atomic and molecular structure/Complexation	• Lectures	• Paper- based exams
4-6	6	• Understanding the concept of essential and non- essential elements	• Essential and traceions: Iron, copper, sulfur, iodine • Non-essential ions: Fluoride, bromide, lithium, gold, silverand mercury • Gastrointestinal agents: Acidifyingagents	• Lectures	• Paper- based exams
7	2	• The chemistry of antacids	• Antacids	• Lectures	• Paper- based exams

8+9	4	• Miscellaneous inorganic agents	• Protectiveadsorbents • Topical agents • Dental agents	• Lectures	• Paper- based Exams
10-15	12	• Understanding the concept of radio therapeutics	• Radiopharmaceutical preparations • Radio opaque and contrast media	• Lectures	• Paper- based Exams
1-6	12	• Acid basereactions	• Acid base reactions	• Practical	• Lab-based unknown and quiz
7+8	4	• Assay of sodium benzoate	• Assay of sodium benzoate	• Practical	• Lab-based unknown and quiz
9+10	4	• Assay of Borax	• Assay of Borax	• Practical	• Lab-based unknown and quiz
11+12	4	• Assay of citricacid	• Assay of citric acid	• Practical	• Lab-based unknown and quiz
13+14	4	• Assay of magnesiumhydroxide	• Assay of magnesium hydroxide	• Practical	• Lab-based unknown and quiz
15	2	• Assay of ammoniated mercury	• Assay of ammoniated mercury	• Practical	• Lab-based unknown and quiz

11. Course Evaluation

- 20 M Theoretical assessment (paper-based midterm exam, attendance)
- 20 M Practical assessment (attendance, quizzes, unknows, reports)
- 60 M paper-based theoretical final exam

_____

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Block, Roche Soine and Wilson, Inorga Medicinal and Pharmaceutical Chemistry,198
Main references (sources)	Wilson and Gisvold Textbook of Orga medicinal and Pharmaceutical chemis Delgado JN, Remers WA, (E 12thedition,2010 Laboratory Handbook for Practical Inorga Pharmaceutical
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

Course Description Form

1. Course Name:
Pharmacognosy II (Theoretical+ Practical)
2. Course Code:
013021
3. Semester / Year:
1st Semester/3rd year
4. Description Preparation Date:
01/9/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Prof :- Madiha Hamoodi
Practical
Assistant Lecturer: Mustaffa Hasan Alwan
8. Course Objectives

Course Objectives Obtaining the theoretical information about plant components and how to extract them.	• The course includes the basics of extracting act glycosidic compounds from plants and knowing t importance to humans.
9. Teaching and Learning Strategies	
Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations and extraction techniques.
10.	Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Introduction; general	Introduction to Pharmacognosy	Theoretical lectures	Paper-based exams

		biosynthesis pathways Cardioactive glycosides		Laboratory experiments	
2	3+2	Carbohydrates Anthraquinone glycosides	Introduction Pharmacognosy	Theoretical lectures Laboratory demonstration	Paper-based exams
3	3+2	Glycosides; biosynthesis, chemical and physical properties, cardiac glycosides, saponin glycosides, anthraquinone glycosides Saponin glycosides	Introduction Pharmacognosy	Theoretical lectures Laboratory demonstration	Paper-based exams
4	3	Flavonoid glycosides, cyanophore glycosides Tannins	Introduction Pharmacognosy	Theoretical lectures Laboratory demonstration	Paper-based exams
5	3+2	Glycosides; isothiocyanate glycosides, aldehyde glycosides, alcoholic glycosides, phenolic glycosides, lactone glycosides, coumarins and chromones Tannins	Introduction Pharmacognosy	Theoretical lectures Laboratory demonstration	Paper-based exams
6	3+2	Resins and resin combination; tannins Volatile oils	Introduction Pharmacognosy	Theoretical lectures Laboratory experiments	Paper-based exams

Course Description Form

1. Course Name:
Biochemistry II (Theoretical+ Practical)
2. Course Code:
013042
3. Semester / Year:
2nd Semester/3rd year
4. Description Preparation Date:
1/09/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Lecturer :- Rana Khudair
Practical
Assistant Lecturer :- Sara Salah

8. Course Objectives	
Course Objectives The course teaches the biochemical processes by wh all living organisms sustain life. Metabolism is the s of all chemical processes occurring within living c and organisms.	The course detailed the biochemical reactio accompanied the metabolism of carbohydrates, proteins, and lipids

9. Teaching and Learning Strategies	
Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations, clinical blood tests, and general urine examination.

10.	Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Biomedical importance Free energy Coupling of endergonic and exergonic reactions The role of ATP Adenylyle kinase interconverts adenine nucleotides	Bioenergetic	Theoretical lectures Laboratory experiments	Paper-based exams
2	3+2	free energy changes can expressed in terms of red potential, oxidases use oxygen as a hydrogen acceptor, many dehydrogenases depend nicotinamide coenzymes hydroperoxidases use hydrogen peroxide or an organic peroxide as substrate	Biologic oxidation	Theoretical lectures Laboratory demonstration .	Paper-based exams
3	3+2	Respiratory Chain Complexes The Chemiosmotic Theory ATP Synthase Amount of energy produced via oxidative phosphorylation vs. substrate level phosphorylation Inhibitors of The Respiratory Chain Respiratory Chain Control and the Action of Uncouplers Transfer of reducing equivalents through the inner mitochondrial membrane	The phosphorylation.	Theoretical lectures Laboratory demonstration .	Paper-based exams
4	3+2	Introduction Levels of organization of metabolic pathways Regulation of the Flux of Metabolites through Metabolic Pathways Clinical Aspects	Overview metabolism		
5	3+2	Reactions of the Citric Acid Cycle	Citric acid Cycle	Theoretical lectures	Paper-based exams

		Energetics of the Citric Acid Cycle Roles of the B vitamins in the Citric Acid Cycle Anaplerotic reactions Regulation of the Citric Acid Cycle		Laboratory demonstration	
6	3+2	Reactions of the Glycolysis The Fates of Pyruvate Glycolysis and Pyruvate dehydrogenase Regulation Clinical Aspects	Glycolysis	Theoretical lectures Laboratory experiments	Paper-based exams
7	3+2	Biomedical importance Glycogenesis, Glycogenolysis The regulation of glycogenesis and glycogenolysis	Metabolism of glycogen	Theoretical lectures Laboratory demonstration	Paper-based exams
8	Mid-term exam				
9	3+2	Biomedical importance Gluconeogenesis reactions Regulation of gluconeogenesis Cori cycle	Gluconeogenesis	Theoretical lectures Laboratory demonstration	Paper-based exams
10	3+2	Biomedical importance PPP reactions Uronic acid pathway Fructose metabolism Galactose metabolism Metabolism of amino sugars	Pentose phosphate pathway and other pathways of hexose metabolism	Theoretical lectures Laboratory demonstration	Paper-based exams
11	3+2	Biomedical importance Lipogenesis reactions The source of acetyl- coA and NADPH Elongation of fatty acids Regulation of lipogenesis Biosynthesis of unsatura fatty acids.	Biosynthesis of fatty acids	Theoretical lectures Laboratory demonstration	Paper-based exams
12	3+2	Biomedical importance Carnitine cycle Reactions of fatty acid oxidation	Oxidation of fatty ac	Theoretical lectures Laboratory demonstration	Paper-based exams

		Energy production from fatty acid oxidation Oxidation of unsaturated fatty acids Ketogenesis The regulation of ketogenesis			
13	3+2	Biomedical importance Biosynthesis of acylglycerols Biosynthesis of alkylglycerols Degradation of acylglycerols Biosynthesis of sphingolipigs Biosynthesis of glycolipi	Metabolism of acylglycerol and sphingolipids	Theoretical lectures Laboratory demonstration	Paper-based exams
14	3+2	Biomedical importance Structure of lipoproteins Metabolism of lipoproteins Storage and hydrolysis o triacylglycerol	Lipid transport and storage	Theoretical lectures Laboratory demonstration	Paper-based exams
15	3+2	Cholesterol synthesis, transport, and excretion	Cholesterol	Theoretical lectures Laboratory demonstration	Paper-based exams
16	3+2	Tansamination Assimilation of free ammonia Modification of the carbon skeletons of existing amino acids synthesis of hydroxyproline, hydroxylysine, and selenocysteine	Biosynthesis of the Nutritionally Nonessential Amino Acids	Theoretical lectures Laboratory demonstration	Paper-based exams
17	3+2	Introduction Deamination Urea cycle reactions, regulation, and disposal of urea Metabolic Disorders of Urea cycle.	Catabolism of Protei & of Amino Acid Nitrogen	Theoretical lectures Laboratory demonstration	Paper-based exams
18	3+2	Specific keto acid products of deaminated amino acids One-carbon units metabolism	Catabolism of the Carbon Skeletons of Amino Acids	Theoretical lectures Laboratory demonstration	Paper-based exams

		Metabolic diseases of dmino acids catabolism			
19	3+2	Conversion of Amino Acids to Specialized Products	Conversion of Amin Acids to Specialized Products	Theoretical lectures Laboratory demonstration	Paper-based exams
20	3+2	Introduction Biosynthesis of Heme: reactions, regulation, and disordes Catabolism of Heme	Porphyrins & Bile Pigments	Theoretical lectures Laboratory demonstration	Paper-based exams
21	Students' seminars				

11. Course Evaluation
• 20 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance + seminar) • 20 M practical assessment (attendance + quiz + practice) • 60 M paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources	
Required textbooks	Harper's
Main references (sources)	Lippincott-biochemistry-6th-edition 2014
Electronic References, Websites	https://pbthru.com/biochemistry-basics https://www.lecturio.com/medical-courses/biochemistry-basics.course#/

Course Description Form

1. Course Name:
Organic Pharmaceutical Chemistry I
2. Course Code:
01 3 060
3. Semester / Year:
2nd Semester/ 3rd year
4. Description Preparation Date:
21/08/2025
5. Available Attendance Forms:
Students' signatures on attendance sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours theory + 2 hours practical (75) / 4 units
7. Course administrator's name (mention all, if more than one name)
Theory
Name: Assist. Prof. Dr. Mohammed Udai
Practical
Lecturer :- Basman Kasim Shareef

8. Course Objectives	
Course Objectives	• Introducing the students to pharmaceutical chemistry • Explaining modern drug design techniques • Introducing drug metabolism

9. Teaching and Learning Strategies	
Strategy	• Theory lectures with teaching aids such as videos and diagrams • Practical sessions where students actively perform experiments

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1+2	4+4	• Understanding the role of pharmaceutical chemistry in drug distribution • Understanding redox reactions	• Drug distribution • Redox reactions	• Lectures • Practical	• Paper- based exams • Lab-based unknows
2+3	3+4	• Understanding the effect of chemical properties on drug action	• Acid-base properties • Redox reactions	• Lectures • Practical	• Paper- based exams

		• Understanding redox reactions			• Lab-based quiz
3+4	5+2	• Understanding the concept of QSAR in drug design • Understanding redox reactions	• Statistical prediction of pharmacological activity • Redox reactions	• Lectures • Practical	• Paper- based exams • Lab-based quiz
5+6+7	9	• Applying the concepts of computer simulations to drug design	• Molecular modeling (Computer aided drug design) • Drug receptor interaction: force involved • Steric features of drugs • Optical isomerism and biological activity • Calculated conformation • Three- dimensional quantitative structure activity relationships and databases • Isosterism • Drug-receptor interaction and subsequent events	• Lectures	• Paper- based Exams
5+6	4	• Assay of ferrous sulfate	• Assay of ferrous sulfate	• Practical	• Lab-based unknown and quiz
7+8	4	• Preparation and standardization of 0.1Na2S2O4 solution	• Preparation and standardization of 0.1Na2S2O4 solution	• Practical	• Lab-based unknown and quiz
8-15	24	• Understanding the concept of drug metabolism and the factors affecting it	• General pathways of drug metabolism	• Lectures	• Paper- based exam
9+10	4	• Assay of copper sulfate	• Assay of copper sulfate	• Practical	• Lab-based unknown and quiz

11+12	4	• Assay of Chlorinated Lime	• Assay of Chlorinated Lime	• Practical	• Lab-based unknown and quiz
13+14	4	• Preparation and assay of Lugol's Solution	• Preparation and assay of Lugol's Solution	• Practical	• Lab-based unknown and quiz
15	2	• Assay of Alum	• Assay of Alum	• Practical	• Lab-based unknown and quiz

11. Course Evaluation

- 20 M: Theoretical assessment (paper-based midterm exam, attendance)
- 20 M: Practical assessment (attendance, quizzes, unknows, reports)
- 60 M: paper-based theoretical final exam

_____

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Wilson and Gisvold Textbook of Orga medicinal and Pharmaceutical chemis Delgado JN, Remers WA, (Eds); 12thediti 2010 Laboratory department.
Main references (sources)	Wilson and Gisvold Textbook of Orga medicinal and Pharmaceutical chemis Delgado JN, Remers WA, (Eds); 12thediti 2010 Laboratory
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Pharmaceutical technology II (Theoretical+ Practical)
2. Course Code:
01 3 032
3. Semester / Year:
2nd Semester/3rd year
4. Description Preparation Date:
28/08/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Practical
Lecturer :- Noor Hasoon Swaih
8. Course Objectives
Course Objectives To teach theoretical bases for the technology of preparing different dosage forms with respect their raw materials, compositions, methods of preparation, stability, storage and uses; in addit to define and characterize the possible incompatibilities that may occur in dosage forms
9. Teaching and Learning Strategies

Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	3+2	Introduction Definition of emulsion Types of emulsion and terminology Classification of emulsions according to -physical state -route of administration Disadvantage of	Emulsion	Theoretical lectures. Laboratory experiments	Paper-based exams
		emulsion Theory of emulsion			
2	3+2	Main properties Types Calculation of concentration of SAA Small Scale Large scale main method of emulsification	Emulsifying agent Methods of preparation of emulsion	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	stability of emulsions terms associated with emulsions storage of emulsion preservation	Emulsion	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	Definition Advantages Route of administration Site of drug delivery Supp. Shapes Types and example of Suppository Fate of Suppository	Suppositories Inserts	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	Ideal properties Types of bases Suppository Molds Determination of the amount of base* Vaginal Inserts* Packaging and Storage*	Suppository Bases Methods of preparation	Theoretical lectures. Laboratory experiments.	Paper-based exams

6	3+2	introduction Ideal properties of ointment base types of ointment bases(USP) comparison between the ointment bases Selection of ideal ointment base	Semisolids	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	Preparation of ointment COMPENDIAL REQUIREMENTS FOR OINTMENTS ophthalmic ointment (sterile ointment) Creams (vanishing	Semisolids	Theoretical lectures. Laboratory demonstration.	Paper-based exams
		creams) Definition pastes definition gels definition			
8	Mid-term exam				
9	3+2	Introduction Definition Route of administration Granules Uses of powders Characterization of powders Flowability	Powders and Granules	Theoretical lectures. Laboratory demonstration.	Paper-based exams
10	3+2	Particle size reduction Comminution of drugs Blending of powders Powder papers Medicated powders Route of administration Problems associated with particle size reduction Dispensing of powders Granules	Powders and Granules.	Theoretical lectures. Laboratory demonstration.	Paper-based exams

11	3+2	Definition Advantages of capsules Types of capsules (Shell) Hard gelatin capsules manufacture of hard gelatin shells Preparation of filled hard gelatin capsules	Capsules	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	Soft gelatin capsules Enteric coated capsules Counting of capsules Storage of capsules Examples of some official capsules	Capsules	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	Pharmaceutical aerosols definition main advantage components of aerosols and example Pharmaceutical foams	Aerosols and Foams	Theoretical lectures. Laboratory demonstration.	Paper-based exams
		definition advantages type of foams and example			
14	3+2	introduction types of incompatibility Physical Incompatibility chemical incompatibility	Pharmaceutic Incompatibili	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	Students' seminars				

11. Course Evaluation

- 20 M Theoretical assessment;

(paper-based mid-term exam + quiz + attendance + seminar)

- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources

Required textbooks	1. Ansel's pharmaceutical dosage forms and drug delivery system, 11th Edition.

Main references (sources)	1. Encyclopedia
Electronic References, Websites	http://www.thepoint.lww.com/Allen

Course Description Form

1. Course Name:
Pharmacognosy III (Theoretical+ Practical)
2. Course Code:
013022
3. Semester / Year:
2nd Semester/3rd year
4. Description Preparation Date:
28/09/2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Dr Madiha Hamoodi
Practical
Assistant Lecturer: Mustafa Hasan Alwan

8. Course Objectives	
Course Objectives Obtaining the theoretical information about plant components (alkaloids), antibiotics and phytotherapy and how to extract them.	• The course includes the basics extracting active alkaloids compou from plants and knowing t importance to humans.

9. Teaching and Learning Strategies	
Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations and extraction techniques.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	3+2	Alkaloids; Introduction; Ornithine-derived alkaloid Tropane alkaloids. Isolation of Peganum harmala alkaloids.	Alkaloids	Theoretical lectures Laboratory experiments	Paper-based exams
2	3+2	Pyrrolizidine alkaloids, Lysine-derived alkaloids. Preparation of Khellin.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams
3	3+2	Phenylalanine-, tyrosine-dihydroxyphenylalanine-derived alkaloids, Protoalkaloids. Flavonoids of Ruta graveolens.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams
4		Benzylisoquinoline derivatives, Tetrahydroisoquinoline. Extraction of hesperidin.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams
5	3+2	Monoterpenoid alkaloids glycosides. Isolation of pectin.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams
6	3+2	Amaryllidaceae alkaloids. Isolation of citric acid fro lemon juice.	Alkaloids	Theoretical lectures Laboratory experiments	Paper-based exams
7	3+2	Phenethylisoquinoline alkaloids. Isolation of citric acid fro lemon juice.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams
8	Mid-term exam				
9	3+2	Tryptophan-derived alkaloids. Isolation of Podophyllotox from Podophyllum emodi.	Volatile oils	Theoretical lectures Laboratory demonstration	Paper-based exams
10	3+2	Miscellaneous alkaloids Indolizidine alkaloids Imidazole alkaloids. Isolation of Rotenone from Lonchocarpus Spp.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams
11	3+2	Purine alkaloids Reduced pyridine alkaloid	Alkaloids	Theoretical lectures	Paper-based exams

Course Description Form

1. Course Name:	
Pharmacology I	
2. Course Code:	
01 3 070	
3. Semester / Year:	
2nd semester/ 3rd year	
4. Description Preparation Date:	
20-08-2025	
5. Available Attendance Forms:	
Attendance Excel sheets	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 hours per week (45 hours)/ 3 Units	
7. Course administrator's name	
Lecturer :- Noor Hasoon	
8. Course Objectives	
Course Objectives	Understand Fundamental Concepts of Pharmacology Apply pharmacokinetic principles to predict drug absorption, distribution, metabolism, and excretion. Interpret the molecular targets of drugs, including receptors, enzymes, ion channels, and transporters, to understand their physiological and therapeutic effects. Apply pharmacological concepts to comprehend how adrenergic and cholinergic medications affect the autonomic nervous system, and how antibiotics work against bacterial pathogens.
9. Teaching and Learning Strategies	
Strategy	• Lectures and Interactive Presentations • Case-Based Learning • Interactive Workshops and Seminars • Self-Directed Learning and Research Projects • Assessment Strategies

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Acquired Pharmacological Knowledge	General Introduction to Pharmacology	Lecture	Quizzes and Exams
1-2	4	Acquired Pharmacological Knowledge	Pharmacokinetics	Lecture	Quizzes and Exams
3	4	Acquired Pharmacological Knowledge	Drug Receptor Interaction and Pharmacodynamics	Lecture	Quizzes and Exams
4	2	Acquired Pharmacological Knowledge	The autonomic nervous system (ANS)	Lecture	Quizzes and Exams
5-6	6	Acquired Pharmacological Knowledge	Cholinergic system	Lecture	Quizzes and Exams
7-8	6	Acquired Pharmacological Knowledge	Adrenergic system	Lecture	Quizzes and Exams
9	2	Acquired Pharmacological Knowledge	Principal of antimicrobial therapy	Lecture	Quizzes and Exams
9-10	4	Acquired Pharmacological Knowledge	β- lactam and other cell wall synthesis inhibitor antibiotics	Lecture	Quizzes and Exams
11-12	4	Acquired Pharmacological Knowledge	Protein synthesis inhibitors	Lecture	Quizzes and Exams
12-13	3	Acquired Pharmacological Knowledge	Quinolones, Folate antagonists, and urinary tract antiseptics	Lecture	Quizzes and Exams
13	2	Acquired Pharmacological Knowledge	Antimycobacterial drugs	Lecture	Quizzes and Exams
14	2	Acquired Pharmacological Knowledge	Antifungal drugs	Lecture	Quizzes and Exams
14	1	Acquired Pharmacological Knowledge	Antiprotozoal drugs	Lecture	Quizzes and Exams
15	2	Acquired Pharmacological Knowledge	Anthelmintic drugs	Lecture	Quizzes and Exams
15	1	Acquired Pharmacological Knowledge	Antiviral drugs	Lecture	Quizzes and Exams
11. Course Evaluation					

• 30 M mid-term (Quizzes (5%); Midterm Exam (25%) • 70 M final exam • 100 M total	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	➢ "Lippincott
Main references (sources)	➢ "Basic and Clinical Pharmacology" by Bertram G. Katzung, Susan B. Masters, and Anthony J. Trevor.
Recommended books and references (scientific journals, reports...)	➢ "Rang & Dale's Pharmacology" by James M. Ritter, Rod J. Flower, and Graeme Henderson ➢ "Goodman Laurence L. Brunton, Bjorn C. Knollmann, and Randa Hilal-Dandan.
Electronic References, Websites	➢ PubMed (https://pubmed.ncbi.nlm.nih.gov/) ➢ Medscape (https://www.medscape.com/) ➢ UpToDate (https://www.uptodate.com/) ➢ Pharmacology

Course Description Form

1. Course Name:					
Pharmacy Ethics					
2. Course Code:					
1450234					
3. Semester / Year:					
2nd Semester/3rd year					
4. Description Preparation Date:					
10/10/2025					
5. Available Attendance Forms:					
students list of names					
6. Number of Credit Hours (Total) / Number of Units (Total):					
One hour (theoretical) per week (total 15 hours)/ 1 unit					
7. Course administrator's name (mention all, if more than one name)					
Lecturer :- Salim Dawood					
8. Course Objectives					
Course Objective	• Learning the medical ethics • Learning the ethical considerations in relationship with patients and other health care team				
9. Teaching and Learning Strategies					
Strategy	Lectures and quizzes				
10. Course Structure					
Week	Hour s	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Introduction to Pharmacy ethics	Pharmacy ethics	Lecture	Quiz
2	1	Introduction to Pharmacy ethics	Pharmacy ethics	Lecture	Quiz
3	1	Learning the basic code of ethics	Code of ethics for pharmacists	Lecture	Quiz
4	1	Application of code ethics	Common ethical considerations in pharmaceutical care patients	Lecture	Quiz
5	1	Application of code ethics	Common ethical considerations in pharmaceutical care patients	Lecture	Quiz
6	1	Application of code ethics	Common ethical considerations in pharmaceutical care patients	Lecture	Quiz

7	1	Ethical values in collaboration with health care team	Inter-professional relations	Lecture	Quiz
8	1	Ethical values in collaboration with health care team	Inter-professional relations	Lecture	Quiz
9	1	Solving ethical dilemmas	Making ethical decisions	Lecture	Quiz
10	1	Learning ethical rule in clinical research	Ethical issues related clinical pharmacy research	Lecture	Quiz
11	1	Solving ethical problems in pharmac practice	Ethical problems in t pharmacist's clinical practice	Lecture	Quiz
12	1	Learning ethical role pharmacist in preventing misuse an abuse of medicines	Preventing misuse of medicines	Lecture	Quiz
13	1	Different cases of ethical issues	Case studies in pharmacy ethics	Lecture	Quiz
14	1	Different cases of ethical issues	Case studies in pharmacy ethics	Lecture	Quiz
15	1	Different cases of ethical issues	Case studies in pharmacy ethics	Lecture	Quiz

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

- 30 M mid-term exam
- 70 M final exam

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Ruth Rodgers, (ed.): fast track, law and ethics pharmacy practice. pharmaceutical press, 2010.
Main references (sources)	Joy Wingfield and David Badcott. Pharmacy eth and decision making. Pharmaceutical press, 2007
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

16.2.5 Pharmacognosy I Course Description Form

1. Course Name:
Pharmacognosy I (Theoretical+ Practical)
2. Course Code:
PH1423211
3. Semester / Year
2nd Semester/2nd year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Dr Noor Hassoon noor.hassoon@au.edu.iq
Practical
Assistant lecturer :- Mustafa Hassan Alwan

8. Course Objectives	
Course Objectives To introduce students to the fundame concepts and principles of pharmacogno focusing on the study of natural produ derived	To familiarize students with the identificati collection, preparation, and evaluation of crude dr and herbal medicines. To provide students with an understanding of chemical constituents, pharmacological propert and therapeutic uses of medicinal plants and nat products. To develop practical skills in the extraction, isolati purification, and analysis of bioactive compou from natural sources.

9. Teaching and Learning Strategies	
Strategy	Lecturing Homework Quiz Practical laboratory demonstrations and experiments

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	3+2	*The *Micro measurement and magnification	General Introduction	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	*Drugs from natural sources, crud drugs, official and non- official drugs *Microscopical identification of crude drugs and cell contents	General Introduction	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	*Classification of natural products. *Microscopical identification of crude drugs and cell contents	Introduction pharmacognosy	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	*Plant nomenclature and taxonomy. *Extraction and separation techniques	Introduction pharmacognosy	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	* Cultivation, collection, drying and storage *Extraction and separation techniques	Production of crude drugs	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	*Deterioration of crude natural products *Chromatography	Production of crude drugs	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	*Pharmacological activities of natural products *Chromatography	Natural products	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	Mid-term exam				
9	3+2	*Chemistry of natural drug products *Paper chromatography	Natural products	Theoretical lectures. Laboratory demonstration.	Paper-based exams

10	3+2	Quality control *Paper chromatography	Quality control	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	Phytochemical investigation of herbal products *Introduction to thin-layer chromatography	Phytochemical investigation	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	*Separation technique *TLC on microscope slides	Separation technique	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	Traditional plant medicines as a source of new drugs. *Partition chromatography for the separation of volatile oils	Bioassay-guided fractionation	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	Tissue culture of medicinal plant *Effect of activity of adsorbents on Rf values	Tissue culture of medicinal plant	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11. Course Evaluation					
20 M Theoretical assessments; (Paper-based mid-term exam + quiz + attendance) 20 M practical assessment (attendance + quiz + practice) 60 M paper-based theoretical final exam 100 M total					
12. Learning and Teaching Resources					

Required textbooks	Trease, and Evans,W.C., Pharmacognosy,16th edition,2009,Elsevier Health Sciences.
Main references (sources)	

17 Third year –

17.1 Third year – first semester

17.1.1 Biochemistry I -Course Description Form

1. Course Name:					
Biochemistry I (theoretical and practical)					
2. Course Code:					
PH1431311					
3. Semester / Year:					
1st Semester / 3rd year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 hours Theoretical + 2 hours Practical (75) /4 units					
7. Course administrator's name					
Theoretical					
Mustaffa Huthairi		Email	mustaffa.huthairi@au,edu.iq		
Practical					
Mustaffa Huthairi		Email	mustaffa.huthairi@au,edu.iq		
8. Course Objectives					
Course Objectives The course teaches the basics of biochemistry establish the foundations of essential metabolites macromolecules.			- Amino acids, peptides, proteins, f nucleic acids, as well as carbohydrate - Essentials of enzymes, their names, t mechanism of action, kinetics inhibition - Plasma membrane, the mechanism action of hormones and t classification - The basics of clinical nutrition		
9. Teaching and Learning Strategies					
Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations, microscopic slides and Lab book catalogue				
10. Course Structure					
	Hours	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	3+2	Definitions and terms; proteins, enzymes, DNA; Clinical value	Introduction to the macromolecules in biochemistry	Theoretical lectures Laboratory experiments	Paper-based exa

2	3+2	Structures of amino acids (table of standard amino acids abbreviation and side chain); Classification, properties, isomerism	Amino acids	Theoretical lectures Laboratory demonstration	Paper-based exa
3	3+2	Chemical reactions, Zwitter ions, titration curve calculating isoelectric point values. Examples and questions. Non standards A.A: Structures, existence and clinical value	Amino acids	Theoretical lectures Laboratory demonstration	Paper-based exa
4	3+2	Peptide bond, resonance forms, isomers, physical properties and chemical reactions. Essential poly peptides in human body, structures, roles and clinical values	Peptides	Theoretical lectures Laboratory demonstration	Paper-based exa
5	3+2	Structure and conformations of proteins, Primary structure, Secondary structure (α helix, β sheet), tertiary structure, quaternary structure. Classification, synthesis, cellular functions (Enzymes, cell signaling, and ligand transport, structural proteins), protein in nutrition	Proteins	Theoretical lectures Laboratory experiments	Paper-based exa
6	3+2	Determining amino acids composition, N- terminal amino acid analysis, C-terminal A.A analysis, Edman	Denaturation of proteins and protei sequencing	Theoretical lectures Laboratory demonstration	Paper-based exa

		degradation, prediction protein sequence from DNA/ RNA sequences. Methods of protein study: Protein purification, cellular localization, proteomics and bioinformatics, structure predication and simulation			
7	3+2	Chemistry and classification, biomedical importance, classification of CHO, Stereochemistry of monosaccharides, metabolism of CHO; Physiologically important monosaccharides, glycosides, disaccharides, polysaccharides	Carbohydrates	Theoretical lectures Laboratory demonstration	Paper-based exa
8	**Mid-term exam**				
9	3+2	Introduction, classification of lipids, fatty acids (F.A), nomenclature of F.A, saturated F.A, unsaturated F.A, physical and physiological properties of F.A, metabolism of lipids. Phospholipids, lipid peroxidation and antioxidants, separation and identification of lipids, amphipathic lipids	Lipids	Theoretical lectures Laboratory demonstration	Paper-based exa
10	3+2	Structures and mechanism, nomenclature, classification, mechanisms of catalysis, thermodynamics,	Enzymes	Theoretical lectures Laboratory demonstration	Paper-based exa

		specificity, lock and key model, induced fit model, transition state stabilization, dynamics and function, allosteric modulation. Biological function, cofactors, coenzymes, involvement in disease			
11	3+2	General principles, factors effecting enzyme rates (substrate conc., pH, temperature, etc), single-substrate reaction (Michaelis- Menten kinetics), kinetic constants. Examples of kinetic questions and solutions.	Kinetics	Theoretical lectures Laboratory demonstration	Paper-based exa
12	3+2	Reversible inhibitors, competitive and non-competitive inhibition, mixed-type inhibition, Irreversible inhibition. Inhibition kinetics and binding affinities (*k*i), questions and solutions	Enzyme inhibition	Theoretical lectures Laboratory demonstration	Paper-based exa
13	3+2	multi-substrate reactions, ternary- complex mechanisms, ping-pong mechanisms, non-Michaelis-Menten kinetics, pre-steady- state kinetics, chemical mechanisms	Enzymes: Control activity and uses o inactivators	Theoretical lectures Laboratory demonstration	Paper-based exa
14	3+2	Chemical structure, nucleic acid components, nucleic acid bases, nucleotides and deoxynucleotides (Properties, base pairing, sense and antisense, super-	Nucleic Acid: Biological functio of DNA	Theoretical lectures Laboratory demonstration	Paper-based exa

		coiling, alternative structures, quadruple structures, Genes and genomes, transcription and translation, replication			
15		Plasma membrane structure and function; Biomedical importance, membrane proteins associated with lipid bilayer, membranes protein composition, dynamic structures of membranes, asymmetric structures of membranes, Artificial membranes model, the fluid mosaic model, membrane selectivity, physiological functions of plasma membranes	Biochemistry of extracellular and intracellular communication	Theoretical lectures Laboratory demonstration	Paper-based exa
16		Classification of hormones, biomedical importance, the target cell concept and hormone receptors, biochemistry of hormone signal transduction	Biochemistry of th endocrine system	Theoretical lectures Laboratory demonstration	
17		Biomedical importance, digestion and absorption of carbohydrates, lipids, proteins, vitamins and minerals; energy balance. Biochemistry of hemostasis and clot formation	Nutrition, digestio and absorption	Theoretical lectures Laboratory demonstration	Paper-based exa
18	**Students' seminars**				
11. Course Evaluation					
• 20 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance + seminar) • 20 M practical assessment (attendance + quiz + practice) • 60 M paper-based theoretical final exam 100 M total					

17.1.2 Inorganic Pharmaceutical Chemistry -Course Description Form

1. Course Name:
Inorganic Pharmaceutical Chemistry
2. Course Code:
PH1431211
3. Semester / Year:
1st Semester/3rd Year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signatures on attendance sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours theory + 2 hours practical (60) / 3 units
7. Course administrator's name (mention all, if more than one name)
Theory
Assosciate prof :- Mohammad Udai Mohamad odai77@gmail.com
Practical
Assistant lecturer :- Doaa Mahmood Doaa.mahmood@au.edu.iq
8. Course Objectives

Course Objectives	• Introducing the students to atoms and elements • Explaining the role of inorganic products in pharmacy
9. Teaching and Learning Strategies	
Strategy	• Theory lectures with teaching aids such as videos and diagrams • Practical sessions where students actively perform experiments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	6	• Understanding the structure of atoms and molecules	• Atomic and molecular structure/ Complexation	• Lectures	• Paper-based exams
4-6	6	• Understanding the concept of essential and non-essential elements	• Essential and trace ions: Iron, copper, sulfur, iodine • Non-essential ions: Fluoride, bromide, lithium, gold, silver and mercury • Gastrointestinal agents: Acidifying agents	• Lectures	• Paper-based exams
7	2	• The chemistry of antacids	• Antacids	• Lectures	• Paper-based exams

8+9	4	• Miscellaneous inorganic agents	• Protective adsorbents • Topical agents • Dental agents	• Lectures	• Paper-based Exams
10-15	12	• Understanding the concept of radio therapeutics	• Radiopharmaceutical preparations • Radio opaque and contrast media	• Lectures	• Paper-based Exams
1-6	12	• Acid base reactions	• Acid base reactions	• Practical	• Lab-based unknown and quiz
7+8	4	• Assay of sodium benzoate	• Assay of sodium benzoate	• Practical	• Lab-based unknown and quiz
9+10	4	• Assay of Borax	• Assay of Borax	• Practical	• Lab-based unknown and quiz
11+12	4	• Assay of citric acid	• Assay of citric acid	• Practical	• Lab-based unknown and quiz
13+14	4	• Assay of magnesium hydroxide	• Assay of magnesium hydroxide	• Practical	• Lab-based unknown and quiz
15	2	• Assay of ammoniated mercury	• Assay of ammoniated mercury	• Practical	• Lab-based unknown and quiz

11. Course Evaluation

- 20 M Theoretical assessment (paper-based midterm exam, attendance)
- 20 M Practical assessment (attendance, quizzes, unknows, reports)
- 60 M paper-based theoretical final exam

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Block, Roche Soine and Wilson, Inorga Medicinal and Pharmaceutical Chemistry,19
Main references (sources)	Wilson and Gisvold Textbook of Or medicinal and Pharmaceutical chen Delgado JN, Remers WA, 12thedition,2010 Laboratory Handbook for Practical Inorga Pharmaceutical Chemistry adopted by department.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

17.1.3 Pathophysiology -Course Description Form

1. Course Name:					
Pathophysiology (Theoretical+ Practical)					
2. Course Code:					
PH143121					
3. Semester / Year:					
1st Semester/3rd year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 hours Theoretical + 2 hours Practical (75) /4 units					
7. Course administrator's name					
Theoretical					
prof :- Emad Mohammad Emad.Mahmood@au.edu.iq					
Practical					
Lecturer :- Salim Dawood Salim.dawood@au.edu.iq					
8. Course Objectives					
Course Objectives The course identifies the basic knowledge ab important diseases at the cellular level			• This course enables the students to understanc principles of basic and systemic pathophysiol including cell injury, inflammation, tissue rep and cardiovascular, renal, respirat gastrointestinal, endocrine, reproduct rheumatological, and immune disorders.		
9. Teaching and Learning Strategies					
Strategy	Lecturing Seminars Quiz Practical laboratory demonstrations of macroscopic and microscopic pictures.				
10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	3+2	Cell injury and tissue response; Inflammation and Repair	Overview of syllab	Theoretical lectures. Laboratory experiments	Paper-based exams

2	3+2	Cell injury and tissue response	Cell injury and tiss response	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	Inflammation and Repair	Cell injury and tiss response	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	Disorders of cardiovascular system: Hemodynamic disorders; Hypertension; Coronary heart disease; Rheumatic heart disease; Heart failure	Disorders of cardiovascular syst	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	Disorders of the renal system: Disorders of glomerular functions; Diabetic glomerulosclerosis; Pyelonephritis; Drug related nephropathies; Acute renal failure; Chronic renal failure; Kidney stones	Disorders of rena system	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	Disorders of adrenal function: Adrenal cortical insufficiency; Congenital adrenal hyperplasia; Cushing syndrome; Pheochromocytoma	Disorders of the central nervous syst	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	Disorders of respiratory system: Common Cold & Flu; Pneumonias; Bronchial asthma; COPD; Cystic fibrosis; Tuberculosis	Disorders of respiratory syste	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	**Mid-term exam**				
9	3+2	Diabetes mellitus and metabolic syndrome	Disorders of the endocrine system	Theoretical lectures. Laboratory demonstration.	Paper-based exams

10	3+2	Disorders of thyroid function: Hypothyroidism (Hashimoto thyroiditis); Hyperthyroidism (Graves's disease)	Disorders of the endocrine system	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	Metabolic and rheumatic disorders of skeletal system: Osteoarthritis; Rheumatoid arthritis; Osteoporosis; Osteomalacia and rickets; Gout	Disorders of the skeletal system	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	Disorders of GI and hepatobiliary systems: Peptic ulcer; GERD; Irritable bowel syndrome; Inflammatory bowel diseases; Diarrhea; Celiac disease; Viral hepatitis; Liver cirrhosis; Liver failure; Cholelithiasis	Disorders of GI an hepatobiliary syste	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	Alteration in immune response: Hypersensitivity disorders; Autoimmune disease; Transplantation immunopathology	Disorders of immu responses	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	Helicobacter spp; Bordetella pertussis; Treponema pallidum (Spirochetes);Yersinia pestis; Pasteurella multicidae.	neoplesis	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	**Students' seminars**				

11. Course Evaluation

- 25 M Theoretical assessment; (paper-based mid-term exam + quiz)
- 25 M practical assessment (attendance + quiz + + seminars)
- 50 M paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources

Required textbooks	1. Essentials Concepts of Altered States (Fourth Edition) by Carol Porth PhD (2014)
Main references (sources)	1. Robbins Basic Pathology 10th Editio March 8, 2017. Editors: Vinay Kum Abul Abbas, Jon Aster
Electronic References, Websites	https://youtu.be/UP1aZKQjINo

17.1.4 cPharmaceutical Technology I -Course Description Form

1. Course Name:					
Pharmaceutical Technology I (Theoretical+ Practical)					
2. Course Code:					
PH143221					
3. Semester / Year:					
1st Semester/3rd year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 hours Theoretical + 2 hours Practical (75) /4 units					
7. Course administrator's name					
Theoretical					
Dr Rashad Kaoud rashad.kaoud@au.edu.iq					
Practical					
Lecturer :- Norr Hasoon Swaih Nor.hasson@au.edu.iq					
8. Course Objectives					
Course Objectives To teach theoretical bases for the technology of preparing different dosage forms with respect to their raw materials, compositions, methods of preparation, stability, storage and uses					
9. Teaching and Learning Strategies					
Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations				
10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	3+2	Define the various types of oral and topical liquid dosage forms. List the advantages and disadvantages of using liquid dosage forms in extemporaneous compounded prescriptions and in patient therapy.	Solutions and types of solutions	Theoretical lectures. Laboratory experiments	Paper-based exams

2	3+2	Define solubility and describe how different factors increase or decrease solute solubility in a given solvent.	Solubility: Factor affecting solubility expression of dissolution; dissolut rate versus solubilit preparation of soluti containing non-vola materials.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	Compare and contrast liquid dosage forms to traditional oral dosage forms.	Official	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	Compare and contrast liquid dosage forms to traditional oral dosage forms.	Aqueous soluti containing arom principles; arom waters; methods preparations; stabil	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	Compare and contrast liquid dosage forms to traditional oral dosage forms.	Syrups: sugar ba syrups; artificial sorbitol based syru stability of syrups.	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	Evaluate and select a proper solvent and delivery system for a given solute, purpose, and/or patient population	Preparation of solutions using mix solvent systems; spirits, and elixirs.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	Evaluate and select a proper solvent and delivery system for a given solute, purpose, and/or patient population	Extraction; maceration and percolation.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	**Mid-term exam**				
9	3+2	Evaluate and select a proper solvent and delivery system for a given solute, purpose, and/or patient population	Tinctures; fluid extracts; extracts resins and oleoresins.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
10	3+2	Define clarification process and explain its essential elements	Definition and methods of clarification; filte aids in clarificati	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	Differentiate between a suspension, an emulsion, a gel, and a magma	Dispersed system their classificatio comparisons between different systems.	Theoretical lectures. Laboratory demonstration.	Paper-based exams

17.1.5 Pharmacognosy II -Course Description Form

1. Course Name:
Pharmacognosy II (Theoretical+ Practical)
2. Course Code:
PH1431111
3. Semester / Year:
1st Semester/3rd year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Prof :- Madiha Hamoodi
Practical
Assistant Lecturer: Mustaffa Hasan Alwan
8. Course Objectives

Course Objectives Obtaining the theoretical information about plant components and how to extract them.	• The course includes the basics of extracting act glycosidic compounds from plants and knowing t importance to humans.
9. Teaching and Learning Strategies	
Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations and extraction techniques.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Introduction; general	Introduction to Pharmacognosy	Theoretical lectures	Paper-based exams
		biosynthesis pathways Cardioactive glycosides		Laboratory experiments	
2	3+2	Carbohydrates Anthraquinone glycosides	Introduction Pharmacognosy	Theoretical lectures Laboratory demonstration	Paper-based exams

3	3+2	Glycosides; biosynthesis, chemical and physical properties, cardiac glycosides, saponin glycosides, anthraquinone glycosides Saponin glycosides	Introduction Pharmacognosy	Theoretical lectures Laboratory demonstration	Paper-based exams
4	3	Flavonoid glycosides, cyanophore glycosides Tannins	Introduction Pharmacognosy	Theoretical lectures Laboratory demonstration	Paper-based exams
5	3+2	Glycosides; isothiocyanate glycosides, aldehyde glycosides, alcoholic glycosides, phenolic glycosides, lactone glycosides, coumarins and chromones Tannins	Introduction Pharmacognosy	Theoretical lectures Laboratory demonstration	Paper-based exams
6	3+2	Resins and resin combination; tannins Volatile oils	Introduction Pharmacognosy	Theoretical lectures Laboratory experiments	Paper-based exams

17.2 Third year - second semester

17.2.1 Biochemistry II -Course Description Form

1. Course Name:	
Biochemistry II (Theoretical+ Practical)	
2. Course Code:	
PH1433111	
3. Semester / Year:	
2nd Semester/3rd year	
4. Description Preparation Date:	
1-5-2025	
5. Available Attendance Forms:	
Students' signature on attendance sheet	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 hours Theoretical + 2 hours Practical (75) /4 units	
7. Course administrator's name	
Theoretical	
Mustaffa Huthairi Mustaffa.Huthairi@au,edu,iq	
Practical	
Mustaffa Huthairi Mustaffa.Huthairi@au,edu,iq	
8. Course Objectives	
Course Objectives The course teaches the biochemical processes by wh all living organisms sustain life. Metabolism is the s of all chemical processes occurring within living c and organisms.	The course detailed the biochemical reactio accompanied the metabolism of carbohydrates, proteins, and lipids
9. Teaching and Learning Strategies	
Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations, clinical blood tests, and general urine examination.
10. Course Structure	

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	3+2	Biomedical importance Free energy Coupling of endergonic and exergonic reactions The role of ATP Adenylyle kinase interconverts adenine Nucleotides	Bioenergetic	Theoretical lectures Laboratory experiments	Paper-based exams

2	3+2	free energy changes can expressed in terms of red potential, oxidases use oxygen as a hydrogen acceptor, many dehydrogenases depend nicotinamide coenzymes hydroperoxidases use hydrogen peroxide or an organic peroxide as substrate	Biologic oxidation	Theoretical lectures Laboratory demonstration .	Paper-based exams
3	3+2	Respiratory Chain Complexes The Chemiosmotic Theory ATP Synthase Amount of energy produced via oxidative phosphorylation vs. substrate level phosphorylation Inhibitors of The Respiratory Chain Respiratory Chain Control and the Action of Uncouplers Transfer of reducing equivalents through the inner mitochondrial membrane	The res piratory ch and phosphorylation.	Theoretical lectures Laboratory demonstration .	Paper-based exams
4	3+2	Introduction Levels of organization of metabolic pathways Regulation of the Flux of Metabolites through Metabolic Pathways Clinical Aspects	Overview metabolism		
5	3+2	Reactions of the Citric Acid Cycle	Citric acid Cycle	Theoretical lectures	Paper-based exams

		Energetics of the Citric Acid Cycle Roles of the B vitamins in the Citric Acid Cycle Anaplerotic reactions Regulation of the Citric Acid Cycle		Laboratory demonstration	
6	3+2	Reactions of the Glycolysis The Fates of Pyruvate Glycolysis and Pyruvate dehydrogenase Regulation Clinical Aspects	Glycolysis	Theoretical lectures Laboratory experiments	Paper-based exams
7	3+2	Biomedical importance Glycogenesis, Glycogenolysis The regulation of glycogenesis and glycogenolysis	Metabolism of glycogen	Theoretical lectures Laboratory demonstration	Paper-based exams
8	**Mid-term exam**				
9	3+2	Biomedical importance Gluconeogenesis reactions Regulation of gluconeogenesis Cori cycle	Gluconeogenesis	Theoretical lectures Laboratory demonstration	Paper-based exams
10	3+2	Biomedical importance PPP reactions Uronic acid pathway Fructose metabolism Galactose metabolism Metabolism of amino sugars	Pentose phosphate pathway and other pathways of hexose metabolism	Theoretical lectures Laboratory demonstration	Paper-based exams
11	3+2	Biomedical importance Lipogenesis reactions The source of acetyl- coA and NADPH Elongation of fatty acids Regulation of lipogenesis Biosynthesis of unsatura fatty acids.	Biosynthesis of fatty acids	Theoretical lectures Laboratory demonstration	Paper-based exams
12	3+2	Biomedical importance Carnitine cycle Reactions of fatty acid oxidation	Oxidation of fatty ac	Theoretical lectures Laboratory demonstration	Paper-based exams

		Energy production from fatty acid oxidation Oxidation of unsaturated fatty acids Ketogenesis The regulation of ketogenesis			
13	3+2	Biomedical importance Biosynthesis of acylglycerols Biosynthesis of alkylglycerols Degradation of acylglycerols Biosynthesis of sphingolipigs Biosynthesis of glycolipi	Metabolism of acylglycerol and sphingolipids	Theoretical lectures Laboratory demonstration	Paper-based exams
14	3+2	Biomedical importance Structure of lipoproteins Metabolism of lipoproteins Storage and hydrolysis o triacylglycerol	Lipid transport and storage	Theoretical lectures Laboratory demonstration	Paper-based exams
15	3+2	Cholesterol synthesis, transport, and excretion	Cholesterol	Theoretical lectures Laboratory demonstration	Paper-based exams
16	3+2	Tansamination Assimilation of free ammonia Modification of the carbon skeletons of existing amino acids synthesis of hydroxyproline, hydroxylysine, and selenocysteine	Biosynthesis of the Nutritionally Nonessential Amino Acids	Theoretical lectures Laboratory demonstration	Paper-based exams
17	3+2	Introduction Deamination Urea cycle reactions, regulation, and disposal of urea Metabolic Disorders of Urea cycle.	Catabolism of Protei & of Amino Acid Nitrogen	Theoretical lectures Laboratory demonstration	Paper-based exams
18	3+2	Specific keto acid products of deaminated amino acids One-carbon units metabolism	Catabolism of the Carbon Skeletons of Amino Acids	Theoretical lectures Laboratory demonstration	Paper-based exams

		Metabolic diseases of dmino acids catabolism			
19	3+2	Conversion of Amino Acids to Specialized Products	Conversion of Amin Acids to Specialized Products	Theoretical lectures Laboratory demonstration	Paper-based exams
20	3+2	Introduction Biosynthesis of Heme: reactions, regulation, and disordes Catabolism of Heme	Porphyrins & Bile Pigments	Theoretical lectures Laboratory demonstration	Paper-based exams
21	**Students' seminars**				

11. Course Evaluation
• 20 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance + seminar) • 20 M practical assessment (attendance + quiz + practice) • 60 M paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources	
Required textbooks	Harper's Illustrated
Main references (sources)	Lippincott-biochemistry-6th-edition 2014
Electronic References, Websites	https://pbthru.com/biochemistry-basics https://www.lecturio.com/medical-courses/biochemistry-basics.course#/

17.2.2 Organic Pharmaceutical Chemistry I -Course Description Form

1. Course Name:
Organic Pharmaceutical Chemistry I
2. Course Code:
01 3 060
3. Semester / Year:
2nd Semester/ 3rd year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signatures on attendance sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours theory + 2 hours practical (75) / 4 units
7. Course administrator's name (mention all, if more than one name)
Theory
Name: Assist. Prof. Dr. Mohammed Udai mohammed.uday@au.edu.iq
Practical
Assistant Lecturer :- Doaa Mahmood Doaa.mahmood@au.edu.iq

8. Course Objectives	
Course Objectives	• Introducing the students to pharmaceutical chemistry • Explaining modern drug design techniques • Introducing drug metabolism
9. Teaching and Learning Strategies	
Strategy	• Theory lectures with teaching aids such as videos and diagrams • Practical sessions where students actively perform experiments

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1+2	4+4	• Understanding the role of pharmaceutical chemistry in drug distribution • Understanding redox reactions	• Drug distribution • Redox reactions	• Lectures • Practical	• Paper- based exams • Lab-based unknows
2+3	3+4	• Understanding the effect of chemical properties on drug action	• Acid-base properties • Redox reactions	• Lectures • Practical	• Paper- based exams
		• Understanding redox reactions			• Lab-based quiz

3+4	5+2	• Understanding the concept of QSAR in drug design • Understanding redox reactions	• Statistical prediction of pharmacological activity • Redox reactions	• Lectures • Practical	• Paper- based exams • Lab-based quiz
5+6+7	9	• Applying the concepts of computer simulations to drug design	• Molecular modeling (Computer aided drug design) • Drug receptor interaction: force involved • Steric features of drugs • Optical isomerism and biological activity • Calculated conformation • Three- dimensional quantitative structure activity relationships and databases • Isosterism • Drug-receptor interaction and subsequent events	• Lectures	• Paper- based Exams
5+6	4	• Assay of ferrous sulfate	• Assay of ferrous sulfate	• Practical	• Lab-based unknown and quiz
7+8	4	• Preparation and standardization of 0.1Na2S2O4 solution	• Preparation and standardization of 0.1Na2S2O4 solution	• Practical	• Lab-based unknown and quiz
8-15	24	• Understanding the concept of drug metabolism and the factors affecting it	• General pathways of drug metabolism	• Lectures	• Paper- based exam
9+10	4	• Assay of copper sulfate	• Assay of copper sulfate	• Practical	• Lab-based unknown and quiz

11+12	4	• Assay of Chlorinated Lime	• Assay of Chlorinated Lime	• Practical	• Lab-based unknown and quiz
13+14	4	• Preparation and assay of Lugol's Solution	• Preparation and assay of Lugol's Solution	• Practical	• Lab-based unknown and quiz
15	2	• Assay of Alum	• Assay of Alum	• Practical	• Lab-based unknown and quiz

11. Course Evaluation

- 20 M: Theoretical assessment (paper-based midterm exam, attendance)
- 20 M: Practical assessment (attendance, quizzes, unknows, reports)
- 60 M: paper-based theoretical final exam

_____

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Wilson and Gisvold Textbook of Orga medicinal and Pharmaceutical chemis Delgado JN, Remers WA, (Eds); 12thediti 2010 Laboratory Handbook department.
Main references (sources)	Wilson and Gisvold Textbook of Orga medicinal and Pharmaceutical chemis Delgado JN, Remers WA, (Eds); 12thediti 2010 Laboratory Handbook
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

17.2.3 Pharmaceutical technology II -Course Description Form

1. Course Name:
Pharmaceutical technology II (Theoretical+ Practical)
2. Course Code:
PH1433211
3. Semester / Year:
2nd Semester/3rd year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Assistant lecturer :- ilaf.jabbar@au.edu.iq
Practical
Assistant lecturer :- ilaf.jabbar@au.edu.iq
8. Course Objectives
Course Objectives To teach theoretical bases for the technology of preparing different dosage forms with respect their raw materials, compositions, methods of preparation, stability, storage and uses; in addit to define and characterize the possible incompatibilities that may occur in dosage forms
9. Teaching and Learning Strategies

Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	3+2	Introduction Definition of emulsion Types of emulsion and terminology Classification of emulsions according to -physical state -route of administration Disadvantage of	Emulsion	Theoretical lectures. Laboratory experiments	Paper-based exams
		emulsion Theory of emulsion			

2	3+2	Main properties Types Calculation of concentration of SAA Small Scale Large scale main method of emulsification	Emulsifying agent Methods of preparation of emulsion	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	stability of emulsions terms associated with emulsions storage of emulsion preservation	Emulsion	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	Definition Advantages Route of administration Site of drug delivery Supp. Shapes Types and example of Suppository Fate of Suppository	Suppositories Inserts	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	Ideal properties Types of bases Suppository Molds Determination of the amount of base* Vaginal Inserts* Packaging and Storage*	Suppository Bases Methods of preparation	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	introduction Ideal properties of ointment base types of ointment bases(USP) comparison between the ointment bases Selection of ideal ointment base	Semisolids	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	Preparation of ointment COMPENDIAL REQUIREMENTS FOR OINTMENTS ophthalmic ointment (sterile ointment) Creams (vanishing	Semisolids	Theoretical lectures. Laboratory demonstration.	Paper-based exams
		creams) Definition pastes definition gels definition			

8	**Mid-term exam**				
9	3+2	Introduction Definition Route of administration Granules Uses of powders Characterization of powders Flowability	Powders and Granules	Theoretical lectures. Laboratory demonstration.	Paper-based exams
10	3+2	Particle size reduction Comminution of drugs Blending of powders Powder papers Medicated powders Route of administration Problems associated with particle size reduction Dispensing of powders Granules	Powders and Granules.	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	Definition Advantages of capsules Types of capsules (Shell) Hard gelatin capsules manufacture of hard gelatin shells Preparation of filled hard gelatin capsules	Capsules	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	Soft gelatin capsules Enteric coated capsules Counting of capsules Storage of capsules Examples of some official capsules	Capsules	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	Pharmaceutical aerosols definition main advantage components of aerosols and example Pharmaceutical foams	Aerosols and Foams	Theoretical lectures. Laboratory demonstration.	Paper-based exams
		definition advantages type of foams and example			

14	3+2	introduction types of incompatibility Physical Incompatibility chemical incompatibility	Pharmaceutic Incompatibili	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	**Students' seminars**				

11. Course Evaluation
• 20 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance + seminar) • 20 M practical assessment (attendance + quiz + practice) • 60 M paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources	
Required textbooks	1. Ansel's pharmaceutical dosage forms and drug delivery system, 11th Edition.
Main references (sources)	1. Encyclopedia of
Electronic References, Websites	http://www.thepoint.lww.com/Allen

17.2.4 Pharmacognosy III -Course Description Form

1. Course Name:
Pharmacognosy III (Theoretical+ Practical)
2. Course Code:
PH1433311
3. Semester / Year:
2nd Semester/3rd year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Dr Madiha Hamoodi
Practical
Assistant Lecturer: Mustafa Hasan Alwan Assistant lecturer :- Ali Mazin am428057@gmail.com
8. Course Objectives

Course Objectives Obtaining the theoretical information about plant components (alkaloids), antibiotics and phytotherapy and how to extract them.	• The course includes the basics extracting active alkaloids compou from plants and knowing t importance to humans.

9. Teaching and Learning Strategies	
Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations and extraction techniques.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
	3+2	Alkaloids; Introduction; Ornithine-derived alkaloid Tropane alkaloids. Isolation of Peganum harmala alkaloids.	Alkaloids	Theoretical lectures Laboratory experiments	Paper-based exams
2	3+2	Pyrrolizidine alkaloids, Lysine-derived alkaloids. Preparation of Khellin.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams
3	3+2	Phenylalanine-, tyrosine-dihydroxyphenylalanine-derived alkaloids, Protoalkaloids. Flavonoids of Ruta graveolens.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams

4		Benzylisoquinoline derivatives, Tetrahydroisoquinoline. Extraction of hesperidin.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams
5	3+2	Monoterpenoid alkaloids glycosides. Isolation of pectin.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams
6	3+2	Amaryllidaceae alkaloids. Isolation of citric acid fro lemon juice.	Alkaloids	Theoretical lectures Laboratory experiments	Paper-based exams
7	3+2	Phenethylisoquinoline alkaloids. Isolation of citric acid fro lemon juice.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams
8	**Mid-term exam**				
9	3+2	Tryptophan-derived alkaloids. Isolation of Podophyllotox from Podophyllum emodi.	Volatile oils	Theoretical lectures Laboratory demonstration	Paper-based exams
10	3+2	Miscellaneous alkaloids Indolizidine alkaloids Imidazole alkaloids. Isolation of Rotenone from Lonchocarpus Spp.	Alkaloids	Theoretical lectures Laboratory demonstration	Paper-based exams
11	3+2	Purine alkaloids Reduced pyridine alkaloid	Alkaloids	Theoretical lectures	Paper-based exams

17.2.5 Pharmacology I -Course Description Form

1. Course Name:	
Pharmacology I	
2. Course Code:	
PH1433611	
3. Semester / Year:	
2nd semester/ 3rd year	
4. Description Preparation Date:	
1-5-2025	
5. Available Attendance Forms:	
Attendance Excel sheets	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 hours per week (45 hours)/ 3 Units	
7. Course administrator's name	
Prof. Emad Rasheed emad rashed 55@gmail.com	
8. Course Objectives	
Course Objectives	Understand Fundamental Concepts of Pharmacology Apply pharmacokinetic principles to predict drug absorption, distribution, metabolism, and excretion. Interpret the molecular targets of drugs, including receptors, enzymes, ion channels, and transporters, to understand their physiological and therapeutic effects. Apply pharmacological concepts to comprehend how adrenergic and cholinergic medications affect the autonomic nervous system, and how antibiotics work against bacterial pathogens.
9. Teaching and Learning Strategies	
Strategy	• Lectures and Interactive Presentations • Case-Based Learning • Interactive Workshops and Seminars • Self-Directed Learning and Research Projects • Assessment Strategies

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	Acquired Pharmacological Knowledge	General Introduction to Pharmacology	Lecture	Quizzes and Exams
1-2	4	Acquired Pharmacological Knowledge	Pharmacokinetics	Lecture	Quizzes and Exams
3	4	Acquired Pharmacological Knowledge	Drug Receptor Interaction and Pharmacodynamics	Lecture	Quizzes and Exams
4	2	Acquired Pharmacological Knowledge	The autonomic nervous system (ANS)	Lecture	Quizzes and Exams
5-6	6	Acquired Pharmacological Knowledge	Cholinergic system	Lecture	Quizzes and Exams
7-8	6	Acquired Pharmacological Knowledge	Adrenergic system	Lecture	Quizzes and Exams
9	2	Acquired Pharmacological Knowledge	Principal of antimicrobial therapy	Lecture	Quizzes and Exams
9-10	4	Acquired Pharmacological Knowledge	β- lactam and other cell wall synthesis inhibitor antibiotics	Lecture	Quizzes and Exams
11-12	4	Acquired Pharmacological Knowledge	Protein synthesis inhibitors	Lecture	Quizzes and Exams
12-13	3	Acquired Pharmacological Knowledge	Quinolones, Folate antagonists, and urinary tract antiseptics	Lecture	Quizzes and Exams
13	2	Acquired Pharmacological Knowledge	Antimycobacterial drugs	Lecture	Quizzes and Exams
14	2	Acquired Pharmacological Knowledge	Antifungal drugs	Lecture	Quizzes and Exams
14	1	Acquired Pharmacological Knowledge	Antiprotozoal drugs	Lecture	Quizzes and Exams
15	2	Acquired Pharmacological Knowledge	Anthelmintic drugs	Lecture	Quizzes and Exams
15	1	Acquired Pharmacological Knowledge	Antiviral drugs	Lecture	Quizzes and Exams
11. Course Evaluation					

• 30 M mid-term (Quizzes (5%); Midterm Exam (25%) • 70 M final exam • 100 M total	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	➢ "Lippincott Illustrated Reviews Pharmacology" by Karen Whalen, 7th edition (2020)
Main references (sources)	➢ "Basic and Clinical Pharmacology" by Bertram G. Katzung, Susan B. Masters, and Anthony J. Trevor.
Recommended books and references (scientific journals, reports...)	➢ "Rang & Dale's Pharmacology" by James M. Ritter, Rod J. Flower, and Graeme Henderson ➢ "Goodman & Gilman's: The Pharmacological Basis of Therapeutics" by Laurence L. Brunton, Bjorn C. Knollmann, and Randa Hilal-Dandan.
Electronic References, Websites	➢ PubMed (https://pubmed.ncbi.nlm.nih.gov/) ➢ Medscape (https://www.medscape.com/) ➢ UpToDate (https://www.uptodate.com/) ➢ Pharmacology Education Project (https://pharmacologyeducation.org/)

17.2.6 Pharmacy Ethics -Course Description Form

1. Course Name:	
Pharmacy Ethics	
2. Course Code:	
PH1833511	
3. Semester / Year:	
2nd Semester/3rd year	
4. Description Preparation Date:	
1-5-2025	
5. Available Attendance Forms:	
students list of names	
6. Number of Credit Hours (Total) / Number of Units (Total):	
One hour (theoretical) per week (total 15 hours)/ 1 unit	
7. Course administrator's name (mention all, if more than one name)	
Hiba Hatem :hiba.hatem@au.edu.iq	
8. Course Objectives	
Course Objective	• Learning the medical ethics • Learning the ethical considerations in relationship with patients and other health care team
9. Teaching and Learning Strategies	
Strategy	Lectures and quizzes

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Introduction to Pharmacy ethics	Pharmacy ethics	Lecture	Quiz
2	1	Introduction to Pharmacy ethics	Pharmacy ethics	Lecture	Quiz
3	1	Learning the basic code of ethics	Code of ethics for pharmacists	Lecture	Quiz
4	1	Application of code ethics	Common ethical considerations in pharmaceutical care patients	Lecture	Quiz
5	1	Application of code ethics	Common ethical considerations in pharmaceutical care patients	Lecture	Quiz
6	1	Application of code ethics	Common ethical considerations in pharmaceutical care patients	Lecture	Quiz

7	1	Ethical values in collaboration with health care team	Inter-professional relations	Lecture	Quiz
8	1	Ethical values in collaboration with health care team	Inter-professional relations	Lecture	Quiz
9	1	Solving ethical dilemmas	Making ethical decisions	Lecture	Quiz
10	1	Learning ethical rule in clinical research	Ethical issues related clinical pharmacy research	Lecture	Quiz
11	1	Solving ethical problems in pharmac practice	Ethical problems in t pharmacist's clinical practice	Lecture	Quiz
12	1	Learning ethical role pharmacist in preventing misuse an abuse of medicines	Preventing misuse of medicines	Lecture	Quiz
13	1	Different cases of ethical issues	Case studies in pharmacy ethics	Lecture	Quiz
14	1	Different cases of ethical issues	Case studies in pharmacy ethics	Lecture	Quiz
15	1	Different cases of ethical issues	Case studies in pharmacy ethics	Lecture	Quiz

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

- 30 M mid-term exam
- 70 M final exam

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Ruth Rodgers, (ed.): fast track, law and ethics pharmacy practice. pharmaceutical press, 2010.
Main references (sources)	Joy Wingfield and David Badcott. Pharmacy eth and decision making. Pharmaceutical press, 2007
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

18 Fourth stage –

18.1 Fourth stage -First semester

18.1.1 Biopharmaceutics -Course Description Form

1. Course Name:
Biopharmaceutics
2. Course Code:
PH1841111
3. Semester / Year:
1st Semester /4th year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours Theoretical + 2 hours Practical (60) /4 units
7. Course administrator's name
Theoretical
Lecturer :- Dr. Rashad Kaood Email: Rashad.kaoud@au.edu.iq
Practical
Assiatmnt Lecturer :- Aseel Al Hashimi Email: aseel.abdelamir@au.edu.iq
8. Course Objectives

1. The concept of biopharmaceutics. 2. Identifying factors that are influencing the bioavailability of a drug; these include a. GIT Physiological factors affecting oral dru absorption (oral drugs) b. Physicochemical properties of drug itself (solubility and dissolution rate) c. The type of dosage form and choice of excipients. 3. Bioavailability and bioequivalence studies.	4. Pharmacokinetics of drug absorption including a. One compartment open model. b. Multiple compartment models.

9. Teaching and Learning Strategies	
Strategy	Lecturing Homework Quiz Practical laboratory demonstration, practice and repots

10. Course Structure

	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+2	Concept	Introduction to Biopharmaceutics	Theoretical lectures.	Paper-based exa

2	2+2	GIT Physiological factors influencing gastrointestinal drug	GIT Physiolog factors influenc gastrointestinal drug absorption	Theoretical lectures. Laboratory demonstration.	Paper-based exa
3	2+2	GIT Physiological factors influencing gastrointestinal drug absorption: Mechanisms of drug absorption	GIT Physiolog factors influenc gastrointestinal d absorption	Theoretical lectures. Laboratory demonstration.	Paper-based exa
4	2+2	Drug physicochemical factors influencing drug absorption: Solubility and Dissolution	Drug physicochem factors influencing d absorption	Theoretical lectures. Laboratory demonstration.	Paper-based exa
5	2+2	pH- partitioning hypothesis of drug absorption: pKa and dissociation and lipid solubility	pH-	Theoretical lectures. Laboratory experiments.	Paper-based exa
6	2+2	Dosage form factors influencing drug absorption: type of the dosage form	Dosage form factors influencing drug absorption	Theoretical lectures. Laboratory demonstration.	Paper-based exa
7	2+2	Dosage form factors influencing drug absorption: Excipients	Dosage form factors influencing drug absorption	Theoretical lectures. Laboratory demonstration.	Paper-based exa
8	Mid-term exam				
9	2+2	Bioavailability and Bioequivalence: Types of bioavailability studies	Bioavailability and Bioequivalence	Theoretical lectures. Laboratory demonstration.	Paper-based exa
10	2+2	Pharmacokinetics:	Pharmacokinetics	Theoretical lectures.	Paper-based exa

		One compartment open model		Laboratory demonstration.	
11	2+2	Pharmacokinetics: multiple compartment model	Pharmacokinetics	Theoretical lectures. Laboratory demonstration.	Paper-based exa

12	2+2	Pharmacokinetics: Intra-venous infusion	Pharmacokinetics	Theoretical lectures. Laboratory demonstration.	Paper-based exa
13	2+2	Pharmacokinetics: Protein binding	Pharmacokinetics	Theoretical lectures. Laboratory demonstration.	Paper-based exa
14	2+2	Pharmacokinetics: Dosage regimen	Pharmacokinetics	Theoretical lectures. Laboratory demonstration.	Paper-based exa
15	Seminars				

11. Course Evaluation
• 20 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance + seminar) • 20 M practical assessment (attendance + quiz + practice) • 60 M paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources	
Required textbooks	Pharmaceutics The Science of Dosage Form Design 2Ed M.E.Aulton v
Main references (sources)	Shargel L, Yu AB, (Eds.), Applied Biopharmaceutics and Pharmacokinetics; 6th edition,2012.
Electronic References, Websites	https://www.youtube.com/watch?v=5gJxaWep_Dk

18.1.2 Clinical Pharmacy I -Course Description Form

1. Course Name:					
Clinical Pharmacy I (Theoretical+ Practical)					
2. Course Code:					
PH1841411					
3. Semester / Year:					
1st semester/4th year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 hours Theoretical + 2 hours Practical (60) /3 units					
7. Course administrator's name (mention all, if more than one name)					
Theoretical					
Name: Lec. Sarah Omar saraomer@au.edu.iq					
Practical					
Lecturer :- Sarah Omar saraomer@au.edu.iq					
8. Course Objectives					
Enable the student to deal with the patient inside pharmacy and give medicines without a prescription		The course includes the basics of clinical ca ofdiseases, how to diagnose them, prescribing medications, some cases need referring to a doctor and laboratory or radiological test			
9. Teaching and Learning Strategies					
Strategy	Lecturing Homework Quiz Practical laboratory demonstrations, explaining clinical cases , OTC drugs.				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+2	How to communicate with patient	Introduction to Community pharmacy	Theoretical lectures Practical methods to communicate with patients	Paper-based exams
	2+2	Explain causes, symptoms, treatment in respiratory system	Common cold, flu cough	Theoretical lectures Practical clinical cases	Paper-based exams
3	2+2	Explain causes, symptoms, treatment in respiratory system	Sore throat, allergic rhinitis	Theoretical lectures Practical clinical cases	Paper-based exams

4	2+2	Explain causes, symptoms, treatment in pediatric	head lice, oral thrush pin worm	Theoretical lectures Practical clinical cases	Paper-based exams
5	2+2	Explain causes, symptoms, treatment in G.I. T	Constipation, diarrhoea	Theoretical lectures Practical clinical cases	Paper-based exams
6	2+2	. Explain causes, symptoms, treatment in G.I. T	Heartburn, dysphagia IBS, hemorrhoids	Theoretical lectures Practical clinical cases	Paper-based exams
7	2+2	Explain causes, symptoms, treatment in skin	Hair loss, acne, dandruff	Theoretical lectures Practical clinical cases	Paper-based exams
8	Mid-term exam				
9	2+2	Explain causes, symptoms, treatment in Skin	Foot athletes, Psoriasis, Cold sore	Theoretical lectures Practical clinical cases	Paper-base exams
10	2+2	Explain causes, symptoms, treatment in skin	Eczema, warts, scabies	Theoretical lectures Practical clinical cases	Paper-base exams
11	2+2	Explain causes, symptoms, treatment in oral cavity	Mouth ulcer, oral hygi	Theoretical lectures Practical clinical cases	Paper-base exams
12	2+2	Explain causes, symptoms, treatment in CNS system	Insomnia, Motion sickn migraine	Theoretical lectures Practical	Paper-base exams

				clinical cases	
13	2+2	Explain causes, symptoms, treatment in eye, ear problems	Conjunctivitis, red eyes causes. otitis media	Theoretical lectures Practical clinical cases	Paper-base exams
14	2+2	Nicotine replacement therapy	Dosage forms of NRT	Theoretical lectures Practical clinical cases	Paper-base exams

15	2+2	Explain dietary supplement,	Types of dietary supplement,	Theoretical lectures Practical clinical cases	

11. Course Evaluation
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc • 20 M Theoretical assessment; (paper-based mid-term exam + quiz) • 20 M practical assessment (attendance + quiz + practice) • 60 M paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Community Pharmacy: symptoms, diagnosis treatment
Main references (sources)	Symptoms in Pharmacy: A guide to management of common illness
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

18.1.3 Organic Pharmaceutical Chemistry II -Course Description Form

1. Course Name:					
Organic Pharmaceutical Chemistry II					
2. Course Code:					
PH1841211					
3. Semester / Year:					
1st Semester/ 4th year					
4. Description Preparation Date:					
11-5-2025					
5. Available Attendance Forms:					
Students' signatures on attendance sheets					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 hours theory + 2 hours practical (75) / 4 units					
7. Course administrator's name (mention all, if more than one name)					
Theory					
Associate prof :- Mohammad Udai Mohamad odai77@gmail.com					
Practical					
Assistant lecturer Doaa Mustaffa Doaa.mustaffa@au.edu.iq					
8. Course Objectives					
Course Objectives	• Introducing the students to pharmaceutical chemistry • Explain the interaction between chemical structure and Biological activities.				
9. Teaching and Learning Strategies					
Strategy	• Theory lectures with teaching aids such as videos and diagrams • Practical sessions where students actively perform experiments				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1+2	3+2	• Introduction to Autonomic nervous system • Preparation of Salicylic acid	• Autonomic Nervous System • Organic synthesis	• Lectures • Practical	• Paper-based exams • Lab-based unknows
3+4	3+2	• Cholinergic drugs • Anti-cholinergic drugs • Re-crystallization of salicylic acid	• Autonomic Nervous System • Organic synthesis	• Lectures • Practical	• Paper-based exams • Lab-based quiz
	3+2	• Adrenergic agonist • Antiadrenergic drugs • Synthesis and re-crystallization of aspirin	• Autonomic nervous system • Organic synthesis	• Lectures • Practical	• Paper-based exams • Lab-based quiz

7+8	3+2	• Opioid analgesic • NSAIDs analgesics • Preparation of nitrobenzene	• Analgesics • Sulfonamide synthesis	• Lectures • Practical	• Paper-based Exams • Lab-based quiz
9+10	3+2	• Sedative, hypnotic anxiolytic • Preparation of acetanilide	• Central Nervous System • Sulfonamide synthesis	• Lectures • Practical	• Paper-based Exam • Lab-based quiz
11+12	3+2	• Antiepileptics • Re-crystallization of acetanilide	• Central Nervous System • Sulfonamide synthesis	• Lectures • Practical	• Paper-based Exam • Lab-based quiz
13	3+2	• Antidepressant • Chlorosulfonation of acetanilide	• Central Nervous System • Sulfonamide synthesis	• Lectures • Practical	• Paper-based exam • Lab-based quiz
14	3+2	• Antipsychotics • Amination of ***p***-chlorobenzene sulfonyl chloride	• Central Nervous System • Sulfonamide synthesis	• Lectures • Practical	• Paper-based exam • Lab-based quiz
15	3+2	• Anaesthetics • Hydrolysis of ***p***-chlorobenzene sulfonyl chloride to sulfanilamide	• Anaesthetics • Sulfonamide synthesis	• Lectures • Practical	• Paper-based exam • Lab-based quiz

11. Course Evaluation

- 20 M: Theoretical assessment (paper-based midterm exam, attendance)
- 20 M: Practical assessment (attendance, quizzes, unknows, reports)
- 60 M: paper-based theoretical final exam

- 100 M total

18.1.4 Pharmacology II -Course Description Form

1. Course Name:
Pharmacology II (Theoretical+ Practical)
2. Course Code:
PH1841311
3. Semester / Year:
1st Semester/4th year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Lecturer :- Zaid Osama Ibraheem Zaid.osama@au.edu.iq Practical
Lecturer :- Zaid Osamah Ibraheem Zaid.osama@au.edu.iq
8. Course Objectives

Course Objectives Basic Knowledge about the pharmacology of drugs used for various systemic diseases including, CNS, CVS, GIT, and Respiratory system.	• Providing students with theoret knowledge about the mechanism of action of drugs and side effects they may cause. • Training students and developing t skills in the practical

		aspects of pharmacology.			
9. Teaching and Learning Strategies					
Strategy		Lecturing Homework Quiz Practical laboratory demonstrations.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Understanding activities	Introduction CNS drugs	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	Understanding the deta of Antidepressants Pharmacology	Antidepressant	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	Understanding the deta of Antipsychotics Pharmacology	Antipsychotics	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	Understanding the deta of Various opioids actions	Opioid drugs	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	Understanding the deta of General and Local anesthetics Pharmacology	Anaesthetic drug	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	Understanding the deta of CNS stimulants Pharmacology	CNS stimulants	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	Understanding the deta of Anti-Parkinson drugs Pharmacology	Anti-Parkinson's drugs	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	Mid-term exam				
9	3+2	Understanding the deta of Antiepileptics Pharmacology	Antiepileptics	Theoretical lectures. Laboratory demonstration.	Paper-based exams
10	3+2	Understanding the deta of Sedative & hypnotics drugs Pharmacology	Sedative & hypnotics drugs	Theoretical lectures. Laboratory demonstration.	Paper-based exams
11	3+2	Understanding the details of Antihypertensive drugs	Antihypertensive drugs	Theoretical lectures. Laboratory demonstration.	Paper-based exams

2	3+2	Understanding the details of Antianginal drugs	Antianginal drug	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	Understanding the det of Heart failure drugs	Heart failure dru	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	Understanding the details of Antiarrhythmic drugs	Antiarrhythmic drugs	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	3+2	Understanding the deta of drugs acting on respiratory system	Drugs acting on respiratory syste	Theoretical lectures. Laboratory demonstration.	Paper-based exams
16	3+2	Understanding the deta of GIT drugs	GIT drugs	Theoretical lectures. Laboratory demonstration.	Paper-based exams

11. Course Evaluation

- 20 M Theoretical assessment;

(paper-based mid-term exam + quiz + attendance)

- 20 M practical assessment (attendance + quiz + practice + Homework)
- 60 M paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources

Required textbooks	Lippincott's Illustrated Review
Main references (sources)	Katzung Pharmacology Rang and Dale's Pharmacology Medical Pharmacology at a Glance
Electronic References, Websites	Pubmed.com

18.1.5 Public Health -Course Description Form

1. Course Name:
Public Health (Theoretical only)
2. Course Code:
PH1841511
3. Semester / Year:
1st Semester/4th year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours Theoretical (30)/ 2 units
7. Course administrator's name
Theoretical
Salim Dawood salim.dawood@au.edu.iq
8. Course Objectives
Course Objectives: Public health: General introduction to epidemiology followed by important communica diseases and family health and sexually transmitted and non communicable diseases. Pharmacy practice: common sense knowledge of the community and hospital pharmacy eth and practice basic information,
9. Teaching and Learning Strategies

Strategy	Lecturing Homework Quiz

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	The major definitions of public health terms	Concepts and principles of public health and preventive medicine	Theoretical lectures	Paper-based exams
2	2	The role of statistics in providing a simple data presentation to many health care staff	Public health statistics: Information health care provid	Theoretical lectures	Paper-based exams

3	2	Gastrointestinal tract most common communicable diseases, causative pathogens, treatment, prevention	Communicable diseases: Infecti through the gas intestinal tract	Theoretical lectures	Paper-based exams
4	2	The major concepts in professional work as a health care provider in hospitals, and community pharmacy	Introduction pharmacy practice **Professionalism**	Theoretical lectures.	Paper-based exams
5	2	Skin and respiratory tract most common communicable diseases, causative pathogens, treatment, prevention	Infections thro skin and muc membranes**,** a respiratory tract	Theoretical lectures	Paper-based exams
6	2	Understanding the major thinking and practical steps in handling health care problems	Pharmacy care plan	Theoretical lectures	Paper-based exams
7	2	Major fundamentals required for best method of dispensing medication Most common communicable diseases, causative pathogens, treatment, prevention	Rational drug use Arthropod-borne infections	Theoretical lectures	Paper-based exams
8	**Mid-term exam**				
9	2	Major non communicable diseases widely spread in community and contributing factors	Non-communica disease: Health in transition	Theoretical lectures.	Paper-based exams
10	2	Major role of community pharmacy, regulations, types of health services provided	Community pharmacy	Theoretical lectures.	Paper-based exams
11	2	Major role of hospital pharmacy, regulations, types of health services provided	Hospital pharmac	Theoretical lectures.	Paper-based exams

12	2	Major health issues caused by nutritional problems. Family role in providing best care	Nutritional disord Family health	Theoretical lectures.	Paper-based exams
13	2	Theory of vaccines and their role in protection	Environmental health Innate and acquir Immunity; Immunization	Theoretical lectures.	Paper-based exams
14	2	Major considerations that should be noted before dispensing or using any medicine	Medicine safety	Theoretical lectures.	Paper-based exams
15	**Students' seminars**				

11. Course Evaluation

- 40 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance + seminar)
- 60 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks	1. Lucas AO, Gilles HM, (Eds), Short Textbook of Public Health Medicine for the Tropic, Latest edition. 2. Boh's Pharmacy Practice Manual: A Guide to the Clinical Experience
Main references (sources)	Public Health and Epidemiology at a Glance
Electronic References, Websites	https://www.who.int/ https://www.cdc.gov/index.htm

18.2 Fourth stage – Second semester

18.2.1 Clinical Pharmacy II -Course Description Form

1. Course Name:					
Clinical Pharmacy II (Theoretical+ Practical)					
2. Course Code:					
PH1842611					
3. Semester / Year:					
2nd semester/4th year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 hours Theoretical + 2 hours Practical (60) /3 units					
7. Course administrator's name					
Lecturer Sarah Omar					
8. Course Objectives					
Enable the student to deal with the patient inside pharmacy and give medicines without a prescription			The course includes the basics of clinical ca of diseases, how to diagnose		
9. Teaching and Learning Strategies					
Strategy	Lecturing Homework Quiz Practical laboratory demonstrations, explaining clinical cases , OTC drugs.				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+2	Explain treatment	Anemia	Theoretical lectures. Laboratory	Paper-based exams
				Methods to communicate with patients	
2	2+2	Explain	Asthma	Theoretical lectures. Laboratory clinical cases	Paper-based exams
3	2+2	Explain causes, symptoms, treatment in respiratory system	COPD	Theoretical lectures. Laboratory clinical cases	Paper-based exams

4	2+2	Explain causes, symptoms, treatment in CNS infection	CNS infection	Theoretical lectures. Laboratory clinical cases	Paper-based exams
5	2+2	Explain causes, symptoms, treatment in Diabetes	Diabetes	Theoretical lectures. Laboratory . clinical cases	Paper-based exams
6	2+2	Explain causes, symptoms, treatment in Gout	Gout	Theoretical lectures. Laboratory clinical cases	Paper-based exams
7	2+2	Explain causes, symptoms, treatment in Heart failure	Heart failure	Theoretical lectures. Laboratory clinical cases.	Paper-based exams
8	Mid-term exam				
9	2+2	Explain causes, symptoms, treatment in hypertension	hypertension	Theoretical lectures. Laboratory clinical cases	Paper-based exams
10	2+2	Explain causes, symptoms, treatment in IHD	IHD	Theoretical lectures. Laboratory clinical cases	Paper-based exams
11	2+2	Explain causes, symptoms, treatment in OA+OP	OA+OP	Theoretical lectures. Laboratory clinical cases	Paper-based exams
12	2+2	Explain causes, symptoms,treatment in peptic ulcer	Pepic ulcer	Theoretical lectures. Laboratory clinical cases	Paper-based exams
13	2+2	Explain causes, symptoms, treatment in RA	RA	Theoretical lectures. Laboratory clinical cases	Paper-based exams

14	2+2	Explain causes, symptoms, treatment in TB	TB	Theoretical lectures. Laboratory clinical cases.	Paper-based exams
15	2+2	Explain causes, symptoms, treatment in UTI	UTI	Theoretical lectures. Laboratory	

11. Course Evaluation

- 20 M Theoretical assessment; (paper-based mid-term exam + quiz)
- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Chisholm-Burns MA, Schwinghammer TL, Malone PM, et al. Pharmacotherapy principle and practice. 6th edition. 2022 Clinical pharmacy and therapeutics
Main references (sources)	Joseph
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

18.2.2 Communication Skills -Course Description Form

1. Course Name					
Communication Skills					
2. Course Code					
PH1842111					
3. Semester / Year					
2nd Semester/ 4th year					
4. Description Preparation Date					
1-5-2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total):					
2hr./week / 2 units					
7. Course administrator's name					
Lecturer :- Zaid O Ibraheem Zaid.osama@au.edu.iq					
8. Course Objectives					
Enable the student to obtain theprinciples communication skills for pharmacists					
9. Teaching and Learning Strategies					
Strategy	Lecturing Homework Quiz				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Being an effective communicator, and good interactions with others	Patient-Centered Communication Pharmacy Practice	Theoretical lecture	Paper-based exams
2	2	Understanding the Components of the Interpersonal Communication Model	Principles and Element Interpersonal Communication	Theoretical lector	Paper-based exams
3	2	Understanding the power of non-verbal communication	Nonverbal	Theoretical lecture	Paper-based exams
	2	Understanding Environmental Barriers	Barriers to communicat	Theoretical lectu	Paper-based exams
5	2	Learning the sk that are useful effective listening	Listening and empat responding	Theoretical lectu	Paper-based exams
6	2	Understanding importance of assertiveness	Assertiveness	Theoretical lectu	Paper-based exams

7	2	Learning Communication skills are import for effective interviewing	Interviewing assessment	Theoretical lectu	Paper-based exams
8	2	Learning techniq to Improve Patient understanding	Helping	Theoretical lectures.	Paper-based exams
9	2	Understanding importance of counselling	Patient point-by-point discussi counseling scenario	Theoretical lectures.	Paper-based exams
10	2	Learning medication error and how avoid it	Medication	Theoretical lectures.	Paper-based exams
11	2	Learning general Principles Communicating With patients wit specific needs	Strategies to meet spec needs	Theoretical lectures.	Paper-based exams
12	2	Learning with	Communicating w children and elderly ab medications	Theoretical lectures.	Paper-based exams
13	2	Understanding importance of inter-professiona collaboration	Communication skills inter-professional collaboration	Theoretical lectu	Paper-based exams
14	2	Learning the Rol Electronic communication healthcare	Electronic communicat in healthcare	Theoretical lectu	Paper-based exams
15	2	Understanding importance of ethical behavior	Ethical	Theoretical lectu	Paper-based exams
		when communicating with patients			

11. Course Evaluation

- 30 M Theoretical assessment;

(paper-based mid-term exam + quiz + attendance)

- 70 M paper-based theoretical final exam

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Robert S. B., Carole L. K., William N. Communication Skills in Pharmacy Practice,
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Bruce A. B., Communication Skills Pharmacists;
Electronic References, Websites	https://youtu.be/EHNSBo3SsmY https://youtu.be/KWVoqM9jmEM

18.2.3 General Toxicology -Course Description Form

1. Course Name:
General Toxicology (Theoretical+ Practical)
2. Course Code:
PH1842311
3. Semester / Year:
2nd Semester/ 4th year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Attendance Excel sheets
6. Number of Credit Hours (Total) / Number of Units (Total)
2hours Theoretical + 2 hours Practical (30 hour/3 units)
7. Course administrator's name
Theoretical
Lecturer :- Salim Dawood
Practical
Lecturer :- Salim Dawood

8. Course Objectives	
	The course aims to provide students with the principles and skills required to deal with the toxicity of chemicals and drugs in clinical settings; it enables students to correlate signs and symptoms of toxicitywith the analytical data, and to know how to establish preventive and therapeutic measures for poisoning cases.
9. Teaching and Learning Strategies	
Strategy	• Lectures and Interactive Presentations • Case-Based Learning • Interactive Workshops and Seminars • Self-Directed Learning and Research Projects • Assessment Strategies

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learningmethod	Evaluation method
1	2+2	Acquired General Toxicological Knowledge	General consideration: host factor, environmental factors oftoxic effects	Lecture	Quizzes and Exams

2	2+2	Acquired General Toxicological Knowledge	Carcinogenesis General introduction to practical toxicology	Lecture Laboratory demonstration.	Quizzes and Exams
3	2+2	Acquired General Toxicological Knowledge	Target organs and systemic toxicology: Respiratory system Acute toxicity study, determination of LD50	Lecture Laboratory demonstration.	Quizzes and Exams
4	2+2	Acquired General Toxicological Knowledge	Liver, Kidney Drug toxicity on liver	Lecture Laboratory demonstration.	Quizzes and Exams
5	2+2	Acquired General Toxicological Knowledge	Nervous system Nicotine toxicity	Lecture Laboratory demonstration.	Quizzes and Exams
	2+2	Acquired General Toxicological Knowledge	Cardiovascular system Drug induced toxicity	Lecture Laboratory demonstration.	Quizzes and Exams
7	2+2	Acquired General Toxicological Knowledge	Blood Blood toxicity	Lecture Laboratory demonstration.	Quizzes and Exams
8	Mid-term exam				
9	2+2	Acquired General Toxicological Knowledge	Food Metal toxicity	Lecture Laboratory demonstration	Quizzes and Exams
10	2+2	Acquired General Toxicological Knowledge	Pesticides Pesticide toxicity	Lecture Laboratory demonstration	Quizzes and Exams
11	2	Acquired General Toxicological Knowledge	Metals, Solvents	Lecture	Quizzes and Exams
12	2	Acquired General Toxicological Knowledge	Environmental toxicology: Air pollution, water and soil pollutants	Lecture	Quizzes and Exams

13	2	Acquired General Toxicological Knowledge	Gases (Tear gas, Pepper Spray)	Lecture	Quizzes and Exams
14	2	Acquired General Toxicological Knowledge	CO, Cyanide(H2S)	Lecture	Quizzes and Exams
15	2	Acquired General Toxicological Knowledge	Mutagenesis	Lecture	Quizzes and Exams
16	Students' seminars				

11. Course Evaluation	
20M Theoretical assessment ; (paper-based mid-term exam) 20M practical assessment (attendance + quiz) 60M paper-based theoretical final exam100 M total	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if a	" Casarett and Doull, Toxicology, the Basic Science of Poisons; Fourth edition. (2021)
Main references (sources)	" Casarett and Doull, Toxicology, the Basic Science of Poisons; Fourth edition. (2021)
Recommended books and references (scientific journals, reports...)	Toxicological books in college library.
Electronic References, Websites	PubMed (https://pubmed.ncbi.nlm.nih.gov/) Medscape (https://www.medscape.com/) UpToDate (https://www.uptodate.com/)

18.2.4 Industrial Pharmacy I -Course Description Form

1. Course Name:	
Industrial Pharmacy I (Theoretical+ Practical)	
2. Course Code:	
PH1842211	
3. Semester / Year:	
2nd Semester/4th year	
4. Description Preparation Date:	
25/08/2025	
5. Available Attendance Forms:	
Students' signature on attendance sheet	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 hours Theoretical + 2 hours Practical(75) /4 units	
7. Course administrator's name	
Theoretical	
Lecturer :- Rashad Mustaffa Kaoud .rashad.mustaffa@au.edu.iq	
Practical	
Assist. Lec. Aseel Najim Suhail Aseel.najim@au.edu..iq	
8. Course Objectives	
Course Objectives The course provides an introduction to the essential unit operations used in the manufacture of pharmaceutical products. Unit operations including blending, milling, drying, clarification and sterilization will be addressed.	Students learn to recognize how the output of one process is the input to the next process, and how deviations can cascade along the production sequence until they cause process failures. The course emphasizes design, scale-up, trouble-shooting, and optimization of pharmaceutical unit operations.
9. Teaching and Learning Strategies	
Strategy	Lecturing Homework Quiz Practical laboratory demonstrations, oral exam and practical tests

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Introduction to the pharmaceutical process Introduction in industrial pharmacy and pre-formulation	Principles of pharmaceutical processing	Theoretical lectures. Laboratory experiments	Paper-based exams

2	3+2	Principles and importance of fluid mixing in pharmaceutical manufacturing	Fluid mixing; Flow characteristics; mechanisms of mixing; mixing equipment	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	Understanding the parameters that control solid mixing process	Solid mixing theory and particulate solid variables; forces and mechanisms	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	Introduction into milling as a main pharmaceutical unit operation	Milling; pharmaceutical application; size measurement methods; theory and energy of comminution	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	Describing the main equipment; Discussing the main parameters that control this process	Types of mills; factors influencing milling; selection of mill techniques;	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	Introduction into drying as a main pharmaceutical unit operation	Drying: definition purpose Psychrometry (humidity measurement)	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	Understanding the main theory of drying; Describing the main equipment; Discussing the main parameters that control this process	theory of drying drying of solids, classification of dryer specialized drying methods	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	Mid-term exam				
9	3+2	Introduction into clarification as a main pharmaceutical unit operation	Clarification and filtration: Theory filter media filter aids	Theoretical lectures. Laboratory demonstration.	Paper-based exams
10	3+2	Describing the main equipment; Discussing the main	filter selection sterile operations integrity testing	Theoretical lectures.	Paper-based exams

		parameters that control this process, addressing the essential needed tests for evaluating the filtration process.	equipments and systems (commercial and laboratory)	Laboratory demonstration.	
11	3+2	Introduction into sterilization as an important pharmaceutical unit operation	Sterilization; validation methods; microbial deat kinetics	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	Investigating the different sterilization methods	methods of sterilization (thermal and non-therma mechanisms; evaluation	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	Comprehending the main properties and requirements of sterile products	Pharmaceutical dosage forms; sterile products	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	Understanding the formulation requirements and quality control testing of sterile products	development; formulation; production; processing; quality control	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	Course Review				

11. Course Evaluation

- 20 M Theoretical assessment;

(paper-based mid-term exam + quiz + attendance)

- 20 M practical assessment (attendance + quiz + practice+ reports)
- 60 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks	Lachman L., Liberman H. and Kanig J.; The Theory and Practice of Industrial Pharmacy; Third Edition
Main references (sources)	Lachman L., Liberman L. and Schwartz J. Pharmaceutical Dosage Forms: Tablets; Second Edition : Volume I.
Electronic References, Websites	

18.2.5 Organic Pharmaceutical Chemistry III -Course Description Form

1. Course Name:					
Organic Pharmaceutical Chemistry III					
2. Course Code:					
PH1842511					
3. Semester / Year:					
2nd Semester/ 4th year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Students' signatures on attendance sheets					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 hours theory + 2 hours practical (75) / 4 units					
7. Course administrator's name (mention all, if more than one name)					
Theory					
Lecturer :- Mohammad Udai mohammed.oday@au.edu.iq					
Practical					
Assistant lecturer :- Doaa Mahmood Doaa.mahmood@au.edu.iq					
8. Course Objectives					
Course Objectives	• Introducing the students to pharmaceutical chemistry • Explain the interaction between chemical structure and Biological activities.				
9. Teaching and Learning Strategies					
Strategy	• Theory lectures with teaching aids such as videos and diagrams • Practical sessions where students actively perform experiments				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1+2	3+2	• Introduction and Alkylating agents • Cannizaro reaction (part I).	• Antineoplastic drugs • Organic synthesis	• Lectures • Practical	• Paper- based exams • Lab-based unknows
3+4	3+2	• Antimetabolite	• Antineoplastic drugs	• Lectures • Practical	• Paper- based exams

		• Cannizaro reaction (part II).	• Organic synthesis		• Lab-based quiz
5+6		Plant products; Miscellaneous compounds Re-crystallization of benzoic acid	• Antineoplastic drugs • Organic synthesis	• Lectures Practical	Paper-based exams • Lab-based quiz
7+8	3+2	• Anti HSV drugs • Anti HIV drugs Assay of ascorbic acid (Known sample)	• Antiviral drugs • Organic synthesis	• Lectures • Practical	• Paper- based exams • Lab-based quiz
9+10	3+2	• Systemic antifungals • Local antifungals • Assay of ascorbic acid (unknown)	• Antifungal drugs Organic synthesis	• Lectures • Practical	• Paper- based Exams • Lab-based quiz
11 +12	3+2	• β-Lactam antibiotics • Synthesis of phenol	• Antibacterials Organic synthesis	• Lectures • Practical	• Paper- based Exam Lab-based quiz
13	3+2	• Tetracylines; and Macrolides • Assay of phenol (Known sample and unknown)	• Antibacterials • Organic synthesis	• Lectures • Practical	• Paper- based Exam Lab-based quiz
14	3+2	• Lincomycins and Polypeptides • Re-crystallization of acetanilide	• Antibacterials • Organic synthesis	• Lectures • Practical	• Paper- based exam • Lab-based quiz
15	3+2	• Quinolone	• Antibacterials	• Lectures	• Paper- based exam

		• Synthesis of paracetamol.	• Organic synthesis	• Practical	• Lab-based quiz
11. Course Evaluation					

• 20 M: Theoretical assessment (paper-based midterm exam, attendance) • 20 M: Practical assessment (attendance, quizzes, unknows, reports) • 60 M: paper-based theoretical final exam 100 M total	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Wilson and Gisvold Textbook of Organic medici and Pharmaceutical chemistry, Delgado JN, Rem WA, (Eds); 12thedition,2010 Graham L. Patrick textbook of An Introduction Medicinal Chemistry, latest edition. Laboratory Handbook for Practical Pharmaceut Chemistry adopted by the department.
Main references (sources)	Wilson and Gisvold Textbook of Organic medici and Pharmaceutical chemistry, Delgado JN, Rem WA, (Eds); 12thedition,2010 Laboratory Handbook for Practical Pharmaceut Chemistry adopted by the department.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

18.2.6 Pharmacology III -Course Description Form

1. Course Name:	
Pharmacology III	
2. Course Code:	
PH1842411	
3. Semester / Year:	
2nd Semester/ 4th year	
4. Description Preparation Date:	
1-5-2025	
5. Available Attendance Forms:	
Excel sheets	
6. Number of Credit Hours (Total) / Number of Units (Total):	
2 hours per week (30 hour) /2 units	
7. Course administrator's name	
Lecturer :- Zaid Osamah Ibraheem zaid.osama@au.edu.iq	
8. Course Objectives	
Course Objectives	• Study the pathophysiology of inflammation and illustrate the anti-inflammatory drugs and drugs used in inflammatory condition with important details about biological agent. • Study drugs used in gout • Study the Antidiabetic drugs whether insulin and other Antidiabetic drugs. • Apply pharmacological concepts about hormones of the hypothalamus and pituitary gland, in addition to the hormones of thyroid gland including drugs used in hypo and hyper thyroidism. • Study the gonadal hormones and their inhibitors in addition to contraceptives • Give important information about drugs use in obesity, drugs used in osteoporosis, and drugs used in erectile dysfunction. • Apply pharmacological concepts about anticancer drugs
9. Teaching and Learning Strategies	
Strategy	• Lectures and Interactive Presentations • Case-Based Learning • Interactive Workshops and Seminars • Self-Directed Learning and Research Projects • Assessment Strategies

10.	Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Acquired Pharmacological Knowledge	Hypothalamic and pituitary hormones	Lecture	Quizzes and Exams
2	2	Acquired Pharmacological Knowledge	Thyroid and Antithyroid drugs	Lecture	Quizzes and Exams
3	2	Acquired Pharmacological Knowledge	Estrogens	Lecture	Quizzes and Exams
4	2	Acquired Pharmacological Knowledge	progestins, and androgens	Lecture	Quizzes and Exams
5	2	Acquired Pharmacological Knowledge	Contraceptives	Lecture	Quizzes and Exams
6	2	Acquired Pharmacological Knowledge	The adrenal hormones	Lecture	Quizzes and Exams
7	2	Acquired Pharmacological Knowledge	Drugs affecting bone metabolism	Lecture	Quizzes and Exams
8	2	Acquired Pharmacological Knowledge	Drugs for diabetes (insuli	Lecture	Quizzes and Exams
9	2	Acquired Pharmacological Knowledge	Oral hypoglycemic agents	Lecture	Quizzes and Exams
10	2	Acquired Pharmacological Knowledge	Anti-inflammatory drugs	Lecture	Quizzes and Exams
11	2	Acquired Pharmacological Knowledge	Drugs for RA	Lecture	Quizzes and Exams
12	2	Acquired Pharmacological Knowledge	Drugs for Gout	Lecture	Quizzes and Exams
13	2	Acquired Pharmacological Knowledge	Cancer chemotherapy	Lecture	Quizzes and Exams

14	2	Acquired Pharmacological Knowledge	Cancer chemotherapy	Lecture	Quizzes and Exams
15	2	Acquired Pharmacological Knowledge	Cancer chemotherapy	Lecture	Quizzes and Exams

11. Course Evaluation

- 30 M: Midterm Exam (25%) and Quizzes (5%)
- 70 M: Final Exam

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lippincott Illustrated Reviews Pharmacology, Sixth edition (2015)
Main references (sources)	Basic and Clinical Pharmacology 15th edition (2021)
Recommended books and references (scientific journals, reports...)	Crash Course Pharmacology, Pharmacology of Essential Medicines
Electronic References, Websites	PubMed (https://pubmed.ncbi.nlm.nih.gov/) Medscape (https://www.medscape.com/) Drugs.com, pharmaceuticals

19 Fifth stage –

19.1 Fifth stage -first semester

19.1.1 Applied Therapeutics I -Course Description Form

1. Course Name:	
Applied Therapeutics I	
2. Course Code:	
PH1851311	
3. Semester / Year:	
1st semester / 5th year	
4. Description Preparation Date:	
1-5-2025	
5. Available Attendance Forms:	
Students list of names	
6. Number of Credit Hours (Total) / Number of Units (Total):	
3 hours (45)/3 Units	
7. Course administrator's name (mention all, if more than one name)	
Associate prof Mohammad Mahmood msd_pharm@yahoo.com	
8. Course Objectives	
Course Objective	• Learning the management of common disorders treated in hospital • Provide the students with needed knowledge for diagnosis and management disorders
9. Teaching and Learning Strategies	
Strategy	• Lectures and quizzes

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Interpretation of Lab. data	Review of common laboratory results and interpretation	Lecture	Quiz
2	3	Understanding the basic principle of management	Acute coronary syndrome.	Lecture, Videos	Quiz
3	3	Understanding t basic principles management	Arrhythmias	Lecture, Videos	Quiz
4	3	Understanding t basic principles management	Thrombosis	Lecture, Videos	Quiz
5	3	Understanding t basic principles management	Dyslipidemia Stroke	Lecture, Videos	Quiz

6	3	Understanding t basic principles management	Shock	Lecture, Videos	Quiz
7	3	Understanding t basic principles management	Liver cirrhosis Viral hepatitis	Lecture, Videos	Quiz
8	3	Understanding t basic principles management	Inflammatory bowel diseases	Lecture, Videos	Quiz
9	3	Understanding t basic principles management	Acute renal failure (ARF)	Lecture, Videos	Quiz
10	3	Understanding t basic principles management	Chronic renal failure (CRF) Hemodialysis and peritoneal dialysis	Lecture, Videos	Quiz
11	3	Understanding t basic principles management	Systemic lupus erythematosus (SLE)	Lecture, Videos	Quiz
12	3	Understanding t basic principles management	Benign prostatic hyperplasia (BPH) Acid – base disorder	Lecture, Videos	Quiz
13	3	Understanding t basic principles management	Glaucoma	Lecture, Videos	Quiz
14	3	Understanding t basic principles management	Parenteral nutrition Enteral nutrition	Lecture, Videos	Quiz
15	3	Understanding t basic principles management	Pharmacovigilance	Lecture, Videos	Quiz

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc.

- 30 M mid-term exam+ quiz
- 70 M final paper-based exam

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. Chisholm-Burns MA, Schwinghammer TL, Malone PM, et al. Pharmacotherapy principle and practice. 6th edition. 2022 Clinical pharmacy and therapeutics
Main references (sources)	Joseph T. DiPiro, Robert L. Pharmacother Handbook. 12th Edition. 2025.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

19.1.2 Clinical Chemistry III- Course Description Form

1. Course Name:		
Clinical Chemistry		
2. Course Code:		
PH1851111		
3. Semester / Year:		
1st Semester/5th year		
4. Description Preparation Date:		
1/5/2025		
5. Available Attendance Forms:		
Students' signature on attendance sheet		
6. Number of Credit Hours (Total) / Number of Units (Total)		
3 hours theory + 2 hours practical (total 75)/4 unit		
7. Course administrator's name (mention all, if more than one name)		
Theoretical		
Assistant lecturer	Ebtihal Mohammed	Ebtihal. Mohammed@au.edu.iq
Practical		
Assistant lecturer	Ebtihal Mohammed	Ebtihal. Mohammed@au.edu.iq
8. Course Objectives		
Course Objectives Enabling the student to obtain basic theoretical information for clinical chemistry and how to obtain and preserve samples specimens, and using various kits for laboratory measurement		The important metabolic pathways for different bioactive substances in the body with different disease relation, and their concentrations in body fluids, especially blood, due to their importance in diagnosing diseases such as diabetes and kidney failure,
9. Teaching and Learning Strategies		
Strategy	Lecturing Seminars Homework Quiz	
10. Course Structure		

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+3	Disorders of Carbohydrates metabolism, Hyperglycemia & Diabetes mellitus, Hypoglycemia	Diagnostic test basic	Theoretical lectures & laboratory work	Paper-based exams
2	2+3	Disorders of lipid metabolism	Determination of serum glucose	Theoretical lectures & laboratory work	Paper-based exams
3	2+3	Disorders of lipid metabolism	oral glucose tolerance test	Theoretical lectures & laboratory work	Paper-based exams
4	2+3	Kidney Function Tests	Serum urea determination	Theoretical lectures & laboratory work	Paper-based exams
5	2+3	liver Function Tests	Creatinine determination	Theoretical lectures & laboratory work	Paper-based exams
6	2+3	Diagnostic enzymology	Serum triglyceride	Theoretical lectures & laboratory work	Paper-based exams
7	2+3	Hypothalamus & pituitary endocrinology, disorders of anterior pituitary hormones, disorders of adrenal gland, hypopituitarism.	Total cholesterol	Theoretical lectures & laboratory work	Paper-based exams
8	2+3	Hypothalamus & pituitary endocrinology, disorders of anterior pituitary hormones, disorders of adrenal gland, hypopituitarism	HDL-c determination	Theoretical lectures & laboratory work	Paper-based exams
9	Mid-term exam				
10	2+3	Reproductive system, disorders of gonadal function in males & females, biochemical	Estimation of CK	Theoretical lectures & laboratory work	Paper-based exams

		assessment during pregnancy			
11	2+3	Reproductive system, disorders of gonadal function in males & females, biochemical assessment during pregnancy	Serum bilirubin	Theoretical lectures & laboratory work	Paper-based exams
12	2+3	Tumor markers	Estimation of phosphate	Theoretical lectures & laboratory work	Paper-based exams
13	2+3	Drug interaction with laboratory Tests	Alkaline phosphatase determination	Theoretical lectures & laboratory work	Paper-based exams
14	2+3	Disorders of calcium metabolism	Estimation of ALT	Theoretical lectures & laboratory work	Paper-based exams
15	2+3	Acid-base disorders	Estimation of AST	Theoretical lectures & laboratory work	Paper-based exams

11. Course Evaluation

- 20 M Theoretical assessment

(paper-based mid-term exam + quiz + attendance)

- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Clinical Biochemistry and Metabolic Medicine . Eighth edition. Martin-crook
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	Different scientific websites

19.1.3 Clinical Toxicology -Course Description Form

1. Course Name:
Clinical Toxicology (Theoretical+ Practical)
2. Course Code:
PH1851411
3. Semester / Year:
1st Semester/ 5th year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2hours Theoretical + 2 hours Practical (26 hour/3 units)
7. Course administrator's name
Theoretical
Salim Dawood salem.Dawwod@au.edu.iq
Practical
Salim Dawood salem.Dawwod@au.edu.iq
8. Course Objectives

Course Objectives	The course aims to provide students with the principles and skills required to deal with the toxicity of chemicals and drugs in clinical settings; it enables students to correlate signs and symptoms of toxicity with the analytical data, and to know how to establish preventive and therapeutic measures for poisoning cases.
9. Teaching and Learning Strategies	
Strategy	• Lectures and Interactive Presentations • Case-Based Learning • Interactive Workshops and Seminars • Self-Directed Learning and Research Projects • Assessment Strategies

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	Acquired Clinical Toxicology Knowledge	Initial evaluation and management of the poisoned patient.	Lecture	Quizzes and Exams
2	2+2	Acquired Clinical Toxicology Knowledge	Over the counter: caffeine, theophylline; Antihistamine and decongestant. Laboratory principles or toxicological screening.	Lecture Laboratory demonstration	Quizzes and Exams
3	2+2	Acquired Clinical Toxicology Knowledge	Non-steroidal anti-inflammatory drugs. Cases on Acetaminophen poisoning; Salicylates, evaluation of urine salicylates.	Lecture Laboratory demonstration	Quizzes and Exams
4	2+2	Acquired Clinical Toxicology Knowledge	Vitamins	Lecture	Quizzes and Exams
			Urine analysis of toxins and chemicals.	Laboratory demonstration	
5	2+2	Acquired Clinical Toxicology Knowledge	Toxicity of prescription medications: Cardiovascular drugs; beta blockers Cardiac glycosides toxicity: Digitalis.	Lecture Laboratory demonstration	Quizzes and Exams
6	2+2	Acquired Clinical Toxicology Knowledge	ACE inhibitors, Calcium channel blocker	Lecture	Quizzes and Exams

			Cases on toxicity with foods and dietary supplements.	Laboratory demonstration	
7	2+2	Acquired Clinical Toxicology Knowledge	Antiarrhythmic agents Identification of some common poisons in biological samples	Lecture Laboratory demonstration	Quizzes and Exams
8	Mid-term exam				
9	2+2	Acquired Clinical Toxicology Knowledge	Hypoglycemic drugs Evaluation of cases of toxicity with anti-Parkinsonian drugs.	Lecture Laboratory demonstration	Quizzes and Exams
10	2+2	Acquired Clinical Toxicology Knowledge	CNS depressants; tricyclic antidepressants; anti-cholinergic phenothiazines Evaluation of drug toxicity on human	Lecture Laboratory demonstration	Quizzes and Exams
11	2	Acquired Clinical Toxicology Knowledge	CNS stimulant	Lecture	Quizzes and Exams
12	2	Acquired Clinical Toxicology Knowledge	Drug of Abuse: Opioids; cocaine; phencyclidine; marijuana; lysergic acid	Lecture	Quizzes and Exams
13	2	Acquired Clinical Toxicology Knowledge	Chemical and Environmental toxins: hydrocarbons; household toxins; antiseptic; disinfectants; camphor; moth repellents	Lecture	Quizzes and Exams

14	2	Acquired Clinical Toxicology Knowledge	Botanicals and plants-derived toxins: herbal preparation; toxic plants; poisonous mushrooms	Lecture	Quizzes and Exams
15	Students' seminars				

11. Course Evaluation	
• 20M Theoretical assessment ; (paper-based mid-term exam) • 20M practical assessment (attendance + quiz) • 60M paper-based theoretical final exam • • 100 M total	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if a	• "Gossel TA, Bricker JD, (Eds.); Principles of Clinical Toxicology; 3th edit (2001). • Viccellio P, (Ed.); Handbook of Medicinal Toxicology; latest edition..
Main references (sources)	• "Gossel TA, Bricker JD, (Eds.); Principles of Clinical Toxicology; 3th edition.(2001). • Viccellio P, (Ed.); Handbook of Medicinal Toxicology; latest edition..
Recommended books and references (scientific journals, reports...)	Lippincott's Manual of T oxicology by Lippincott Williams and Wilkins, Wolters Kluwer. 2012
Electronic References, Websites	PubMed (https://pubmed.ncbi.nlm.nih.gov/) Medscape (https://www.medscape.com/) UpTo (https://www.uptodate.com/)

19.1.4 Hospital training -Course Description Form

1. Course Name					
Hospital training (Medicine, Pediatric, Surgery, Gynecology) (Practical)					
2. Course Code					
PH1851511					
3. Semester / Year					
1st Semester\ 5th year					
4. Description Preparation Date					
1\5\2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total):					
2hr.weekly / 2 units					
7. Course administrator's name (mention all, if more than one name)					
ahmed.ibrahim@au.edu.iq Dr Ahmed Ibrahim					
8. Course Objectives					
Enable the student to deal with the patients inside the hospital.					
9. Teaching and Learning Strategies					
Strategy	Lecturing Homework Quiz				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Understanding Hyperbilirubinemi in the newborn	Medicine Endocrine Disor Paediatric Jaundice, Sepsis	Theoretical lectures.	Paper-based exams
2	4	Introducing the students to the rol the wards and	Medicine Peptic Ulcer Surgery	Theoretical lectures.	Paper-based exams

		some basic aspect of surgery.	Role of pharmacist in surgical care.		
3	4	Explaining how to deal with medications surgical patients.	Medicine Hypertension (HTN) Surgery Thromboprophy is	Theoretical lectures.	Paper-based exams
4	4	Understanding Etiology and Clinical features	Medicine Acute Coronary Syndrome Pediatric Gastroenteritis, Febrile convulsi	Theoretical lectures.	Paper-based exams
5	4	Understanding Etiology and Clinical	Medicine Acute Renal Failure Gynaecology Signs and symptoms of pregnancy	Theoretical lectures.	Paper-based exams
6	4	Understanding Etiology and Clinical features, diagnosis and treatment	Medicine Stroke Pediatric Bronchiolitis, pneumonia	Theoretical lectures.	Paper-based exams
7	4	Understanding Etiology and Clinical features, diagnosis and treatment	Medicine Liver Diseases Surgery Intravenous Fluid Therapy.	Theoretical lectures.	Paper-based exams
8	4	Understanding Etiology and Clinical	Medicine COPD Gynecology Ectopic Pregnan	Theoretical lectures.	Paper-based exams
9	4	Understanding Etiology and	Gynecology Diabetics mellite in pregnancy	Theoretical lectures	Paper-based exams

		Clinical diagnosis treatment	Pediatric Asthma, Mening		

11. Course Evaluation
• 40 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance) • 60 M paper-based theoretical final exam • 100 M total

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Pharmacotherapy Principles and Practice, Chisholm Burns 6ed 2022 Drugs in use case studies for pharmacists and Prescribers, Longmore, Murray; Wilkinson, Ian B; Baldwin, Andrew: Wallin, Elizabeth. Oxford Handbook of Clinical Medicine, 9th Edition. Copyright 2014 © Oxford University Press.
Main references (sources)	Manuals for Clinical Training adopted by the department. Nelson Textbook of pediatrics. 29th edition Robert C. Tasker. Oxford Handbook Paediatrics. 2nd edition.2013 Geoffrey Chamberlain. Obstetric by Teachers. 8th edition. 2006.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://youtu.be/98JaiKH2q3E https://ssl.adam.com/graphics/multimedia/e3513/23513.mp4 https://youtu.be/7cNOgyxIAss https://youtu.be/iw3KWezpl3o https://youtu.be/1s0LTriGXg0 https://youtu.be/IQKQ4eoKfTg https://www.youtube.com/watch?v=rTTAnPY4A

19.1.5 Industrial Pharmacy II-Course description form

1. Course Name:
Industrial Pharmacy II (Theoretical+ Practical)
2. Course Code:
PH1851211
3. Semester / Year:
1st Semester/5th year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75) /4 units
7. Course administrator's name
Theoretical
Lecturer Dr- Rashad Kaodd rashad.kaoud@au.edu.iq
Practical
Lecturer Aseel Suhail Najim aseel.najm90@gmail.com
8. Course Objectives
Course Objectives In this course, student will be introduced to an overview of the pre-formulation studies and the drug manufacturing process. Student will review the main steps involved in making a drug product. Different types of drug products will be discussed (we will mainly focus on tablets). Subsequently, the main tools used to examine manufacturing processes and to identify important material properties, process parameters, and product attributes will be discussed.
9. Teaching and Learning Strategies

Strategy	Lecturing Homework Quiz Practical laboratory demonstrations, oral exam and practical tests

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Understanding the basic principles and equipment	Pre-formulation Studies	Theoretical lectures	Paper-based exams

		involved in pre- formulation studies.		Laboratory demonstration	
2	3+2	Understanding the basic principles and equipment involved in pre- formulation studies.	Pre-formulation Studies	Theoretical lectures Laboratory demonstration	Paper-based exams
3	3+2	Exploring the benefits and drawbacks of tablets and identifying the various types of tablets.	Tablets: advantages and disadvantages, and classification	Theoretical lectures Laboratory demonstration	Paper-based exams
4	3+2	Students will become aware of the different kinds of pharmaceutical ingredients and their multiple uses to achieve a product performance objective.	Tablet excipients	Theoretical lectures Laboratory demonstration	Paper-based exams
5	3+2	Students will be familiar with the different steps and different equipment required to manufacture tablets.	Methods of Tablet Manufacturing	Theoretical lectures Laboratory experiments	Paper-based exams
6	3+2	Students will be familiar with the different steps and different equipment required to manufacture tablets.	Methods of Tablet Manufacturing	Theoretical lectures Laboratory demonstration	Paper-based exams
7	3+2	Identifying the different types of tablet coating and reviewing various coating equipment	Tablet Coating	Theoretical lectures Laboratory demonstration	Paper-based exams
8	Mid-term exam				
9	3+2	Comprehending the main tablet properties and methods used to test product properties	In vitro Evaluation of Tablets	Theoretical lectures Laboratory demonstration	Paper-based exams
10	3+2	Reviewing the main tablet problems and how can we address these problems	Tablet Problems	Theoretical lectures Laboratory demonstration	Paper-based exams
11	3+2	Acquiring knowledge of the several categories of modified released tablets. Examining	Modified release tablets	Theoretical lectures	Paper-based exams

		several methodologies for manufacturing these tablets and analyzing their release profiles.		Laboratory demonstration	
12	3+2	Acquiring knowledge of the several categories of modified released tablets. Examining several methodologies for manufacturing these tablets and analyzing their release profiles.	Modified release tablets	Theoretical lectures Laboratory demonstration	Paper-based exams
13	3+2	The student will gain knowledge regarding the microencapsulation method and its application in the field of pharmaceutical manufacturing	Microencapsulation	Theoretical lectures Laboratory demonstration	Paper-based exams
14	3+2	Learning about the different materials and diverse processing equipment utilized in the production of aerosol.	Aerosols	Theoretical lectures Laboratory demonstration	Paper-based exams
15	Course Review				

11. Course Evaluation

- 20 M Theoretical assessment;

(paper-based mid-term exam + quiz + attendance)

- 20 M practical assessment (attendance + quiz + practice+ reports)
- 60 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks	Lachman L., Liberman H. and Kanig J.; The Theory and Practice of Industrial Pharmacy; Third Edition
Main references (sources)	• Lachman L., Liberman L. and Schwartz J. Pharmaceutical Dosage Forms: Tablets; Second Edition: Volume I. • Aulton M.; Pharmaceutics: The Science of Dosage Form Design; International Student Edition. • Ansel H., Allen L. and Jr. Popovich N.; Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems; Eighth Edition.
Electronic References, Websites	

19.2 Fifth stage – Second semester

19.2.1 Applied Therapeutics II -Course description Form

1. Course Name:					
Applied Therapeutics II (Theoretical)					
2. Course Code:					
PH1852411					
3. Semester / Year:					
2nd semester / 5th year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 hours Theoretical (30) /2 units					
7. Course administrator's name					
Prof Mohammed Mahmood E mail msd_pharm@yahoo.com					
8. Course Objectives					
Course Objectives 1- Educate the fifth stage pharmacy students' important diseases and its therapy 2- The use of medications in chronic diseases and in special populations 3- Learning about endocrinology, gynecologic, psychiatric and oncologic diseases					
9. Teaching and Learning Strategies					
Strategy	Lecturing (via lectures and animations about each topic) Homework				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Explain the regulation and physiologic roles of hormones produced by the adrenal glands. Describe adrenal insufficiency	Adrenal gland disorders	Theoretical lectures.	Paper-based exams
2	2	Describe management	Thyroid gland disorders	Theoretical lectures.	Paper-based exams
3	2	Describe the pathophysiology, management of Alzheimer disease	Alzheimer disease	Theoretical lectures.	Paper-based exams

4	2	Describe the pathophysiology, management of anxiety	Generalized anxiety disorders	Theoretical lectures.	Paper-based exams
5	2	Describe the pathophysiology, management of depression	Depressive disorders	Theoretical lectures.	Paper-based exams
6	2	Describe the pathophysiology, management of schizophrenia	Schizophrenia	Theoretical lectures.	Paper-based exams
7	2	Describe the pathophysiology, management of insomnia	Insomnia	Theoretical lectures.	Paper-based exams
	Mid-term exam				
8		Describe the methods of contraception	Contraception	Theoretical lectures.	Paper-based exams
9	2	Describe the methods of hormonal therapy	Hormonal replacement therapy	Theoretical lectures.	Paper-based exams
10	2	Describe the pathophysiology, management of menstruation related disorders	Menstruation related disorders	Theoretical lectures.	Paper-based exams
11	2	Describe the pathophysiology, management of cancer	Cancer chemotherapy & treatment	Theoretical lectures.	Paper-based exams
12	2	Describe the pathophysiology, management of leukemias	Leukemias	Theoretical lectures.	Paper-based exams
13	2	Describe the pathophysiology, management of breast cancer	Breast cancer	Theoretical lectures.	Paper-based exams
14	2	Describe the pathophysiology, management of prostate cancer	Prostate cancer	Theoretical lectures.	Paper-based exams
15	2	Describe the management of chemotherapy induced adverse effects	Adverse effects of chemotherapy		
11. Course Evaluation					

• 30 M Theoretical assessment; (paper-based mid-term exam + Homework+ Attendance) • 70 M paper-based theoretical final exam 100 M total	
12. Learning and Teaching Resources	
Required textbooks	1. Chisholm-Burns 2. Clinical pharmacy and therapeutics
Main references (sources)	1. Joseph Edition. 2024.
Electronic References, Websites	

19.2.2 Dosage Form Design (DFD)-Course Description Form

1. Course Name:					
Dosage Form Design (DFD)					
2. Course Code:					
PH1852111					
3. Semester / Year:					
2nd Semester/5th year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 hours Theoretical /2 units					
7. Course administrator's name					
Theoretical					
Associate prof Shaimaa Nazar					
8. Course Objectives					
1. New drug development and approval process 2. General considerations in dosage form design. 3. Preformulation and Pharmaceutical consideration in dosage form design. 4. Current good manufacturing practice (cGMP) 5. Biopharmaceutics and Pharmacokinetic of drugs in dosage form design					
9. Teaching and Learning Strategies					
Strategy	Lecturing Homework Quiz				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Drug discovery and drug design	New drug development and approval process	Theoretical lectures	Paper-based exams
2	2	Biological characterization And Early formulation	New development approval process	Theoretical lectures	Paper-based exams
3		Clinical studies	New development approval process	Theoretical lectures	Paper-based exams
4	2	1. List common terms used in the Current	cGMP	Theoretical lectures	Paper-based exams

		Good Manufacturing Practice 2. (cGMP) for finished pharmaceuticals 3. 2. Describe the organization and personnel required by cGMP			
5	2	1. Describe the intent and importance of written procedures within the various components of cGMP 2. each type	cGMP	Theoretical lectures	Paper-based exams
6	2	1. Differentiate between pharmaceutical manufacturing and extemporaneous compounding 2.	cGMP	Theoretical lectures	Paper-based exams
7	2	1. List reasons for the incorporation of drugs into various dosage forms 2. Compare and contrast the advantages/disadvantages of various drug dosageforms 3. Describe the information needed in preformulation studies to characterize a drug substance for possible inclusion into a dosage form	Pharmaceutical and formulation considerations	Theoretical lectures	Paper-based exams
8	Mid-term exam				
9	2	1. Describe the five types of drug instability of	Pharmaceutical and formulation considerations	Theoretical lectures	Paper-based exams

		concern to the practicing pharmacist 2. Describe the purpose and general protocol for accelerated stability studies			
11	2	1. Summarize approaches employed to stabilize drugs in pharmaceutical dosage forms 2. Calculate rate reactions for various liquid dosage forms 3. Categorize various pharmaceutical ingredients and excipients	Pharmaceutical and formulation considerations	Theoretical lectures Laboratory demonstration	Paper-based exams
12	2	Principles of drug absorption	Biopharmaceutical and Pharmacokinet consideration	Theoretical lectures	Paper-based exams
13	2	Dissolution and drug absorption	Biopharmaceutical and Pharmacokinet consideration	Theoretical lectures	Paper-based exams
14	2	Bioavailability and bioequivalence	Biopharmaceutical and Pharmacokinet consideration	Theoretical lectures	Paper-based exams
15	Seminars				

11. Course Evaluation
• 30 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance + seminar) • 70 M paper-based theoretical final exam 100 M total

12. Learning and Teaching Resources	
Required textbooks	Ansel's Pharmaceutical Dosage Forms and Drug Delivery
Main references (sources)	Ansel's Pharmaceutical Dosage Forms and Drug Delivery
Electronic References, Websites	

19.2.3 Therapeutic Drug Monitoring -Course Description Form

1. Course Name:					
Therapeutic Drug Monitoring (Theoretical + Practical)					
2. Course Code:					
PH1852211					
3. Semester / Year:					
2nd Semester / 5th year					
4. Description Preparation Date:					
1-5-2025					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 hours theoretical + 2 hours practical per week / 3 units					
7. Course administrator's name (mention all, if more than one name)					
Theoretical + Practical					
Lecturer Ahmad Ibrahim :ahmedij1992ij@yahoo.com					
8. Course Objectives					
Course Objectives		• To study the basic principle of drug kinetics. • To study the applications of clinical pharmacokinetics equations and calculations To study the clinical pharmacokinetics/ pharmacodynamics principle of antibiotics, cardiovascular agents and other drugs.			
9. Teaching and Learning Strategies					
Strategy	Lecturing Quiz Educational videos				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+2	Understanding the basic principles of drug kinetics.	Review of clinical pharmacokinetic (PK)/ pharmacodynamic (PD) Principles. (part 1)	Lecture with video	Paper-based exam
2	2+2	Understanding the basic principles of drug kinetics.	Review of clinical pharmacokinetic (PK)/ pharmacodynamic (PD) principles (part 2)	Lecture	Paper-based exam
3	2+2	Using of clinical PK equations to calculate the required dose	Clinical PK equations and calculations (Extravascular Equation….), part 1	Lecture	Paper-based exam
4	2+2	Using of clinical PK equations to	Clinical PK equations and calculations (Multiple-Dose	Lecture	Paper-based exam

		calculate the required dose	and Steady-State Equations) part 2		
5	2+2	Understanding the Clinical PK in special population and cases	Clinical PK in special population and cases	Lecture	Paper-based exam
6	2+2	Understanding therapeutic drug monitoring (TDM) of aminoglycoside	Clinical PK/PD for Antibiotics (Aminoglycoside)	Lecture	Paper-based exam
7	2+2	Understanding TDM of vancomycin	Clinical PK/PD for Antibiotics (vancomycin)	Lecture	Paper-based exam
8	2+2	Understanding TDM of digoxin	Clinical PK/PD for Cardiovascular agents (Digoxin)	Lecture	Paper-based exam
9	2+2	Understanding TDM of theophylline	Clinical PK/PD of other drugs (Theophylline)	Lecture	Paper-based exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

- 25 M (midterm + written exams)
- 15 M (written exams of practical part+ attendance)
- 60 M (final exam)

- 100 M total

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Applied Clinical Pharmacokinetics, Second Edition, 20 by Larry A. Bauer.
Recommended books and references (scientific journals, reports...)	Clinical Pharmacokinetics Concepts and Applications, Third Edition, 1995 by Malcolm Rowland and Thomas Tozer;
Electronic References, Websites	

19.2.4 Pharmaceutical Biotechnology -Course Description Form

1. Course Name:
Pharmaceutical Biotechnology (Theoretical)
2. Course Code:
PH1862311
3. Semester / Year:
2nd Semester/5th year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
1 hours Theoretical /1 units
7. Course administrator's name
Theoretical
Mohammed Kadhem Abdul Ameer Al Aaraji mohammed.alaraji@au.edu.iq
8. Course Objectives
Course Objectives Identify the most common therapeutic peptides and proteins derived from biotechnological sourc Knowing structure details, formulation requirements, and pharmacist role.
9. Teaching and Learning Strategies

Strategy	Lecturing Homework Quiz

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Importance and Definition of Biotechnology History of Biotechnology derived product	Biotechnology - introduction	Theoretical lectures.	Paper-based exams
2	1	Recombinant DNA biotechnology.	Formulation biotechnology prod (biopharmaceutical consideration)	Theoretical lectures.	Paper-based exams
3	1	Sterilization (chemical + physical Methods). Chemotherapy.	Microbial consideration- steril pyrogen v decontamination	Theoretical lectures.	Paper-based exams

4	1	Types and specification of excipients used in biotechnological formulation	Excipients of paren products - solubi enhancer-anti adsorption age buffer compone preservatives – osm agents.	Theoretical lectures.	Paper-based exams
5	1	Types and specification of excipients used in biotechnological formulation	Excipients of paren products - solubi enhancer-anti adsorption age buffer compone preservatives – osm agents.	Theoretical lectures.	Paper-based exams
6	1	Formulation requirements according to route of administration	Route of administrat Parentral route Oral route.	Theoretical lectures.	Paper-based exams
7	1	Formulation requirements according to route of administration	Route of administrat Parentral route Oral route	Theoretical lectures.	Paper-based exams
8	**Mid-term exam**				
9	1	Formulation requirements according to route of administration	Route of administrat Parentral route Oral route	Theoretical lectures.	Paper-based exams
10	1	Formulation requirements according to route of administration	Route of administrat Alternative routes (nasal-pulmonary- rectal-buccal transdermal	Theoretical lectures.	Paper-based exams
11	1	Formulation requirements according to route of administration	Route of administrat Alternative routes (nasal-pulmonary- rectal-buccal transdermal	Theoretical lectures.	Paper-based exams
12	1	ADME of peptides and proteins Assessments and relationship to pharmacodynamics action	Pharmacokinetic of peptides and protein (Elimination o proteins (proteolysis excretion-metabolis	Theoretical lectures.	Paper-based exams
13	1	ADME of peptides and proteins Assessments and relationship to pharmacodynamics Action	Pharmacokinetic of peptides and protein (Elimination o proteins (proteolysis excretion-metabolis	Theoretical lectures.	Paper-based exams
14	1	ADME of peptides and proteins	Pharmacokinetic of peptides and protein	Theoretical lectures.	Paper-based exams

		Assessments and relationship to pharmacodynamics Action	(Elimination o proteins (proteolysis excretion-metabolis		
15	**Question and answers (Corse review)**				

11. Course Evaluation

- 30 M Theoretical assessments;
  (paper-based mid-term exam)
- 70 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks	1. pharmaceutical biotechnology J Crommelin, Robert D. Syinder
Main references (sources)	1. pharmaceutical biotechnology J Crommelin, Robert D. Syinder
Electronic References, Websites	

19.2.5 Pharmacoeconomic -Course Description Form

1. Course Name:
Pharmacoeconomic (Theoretical)
2. Course Code:
PH1852511
3. Semester / Year:
2nd Semester/5th year
4. Description Preparation Date:
1-5-2025
5. Available Attendance Forms:
Students' signatures on the attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours Theoretical (30) /2 units
7. Course administrator's name
.Dr Salim Dawood Salim.Dawood@au.edu.iq
8. **Course Objectives**
Understand the basic terms of Pharmacoeconomics, how to build the model for economic feasibility studies, and how to extract statistical data from clinical studies to include them in th model for the economic feasibility study.
9. Teaching and Learning Strategies

Strategy	Lecturing Quiz

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	Introducing students to the concept of Pharmacoeconomics and its application areas.	Course overview and basic principles of Pharmacoeconomics	Theoretical lectures.	Paper-based exams
2	2	Healthcare cost categories	Cost analysis 1	Theoretical lectures.	Paper-based exams
3	2	Sources of Cost Data and Cost Terminology	Cost analysis 2	Theoretical lectures.	Paper-based exams

4	2	Learning about the various Methods of Pharmacoeconomics	Cost Minimization Analysis	Theoretical lectures.	Paper-based exams
5	2	Uses of QALY in health economics	Cost-Utility Analysis	Theoretical lectures.	Paper-based exams
6	2	Benefits of Cost-effectiveness Analysis	Cost-effectiveness analysis	Theoretical lectures.	Paper-based exams
7	2	Epidemiological Research	Introduction to Epidemiolog	Theoretical lectures.	Paper-based exams

11. Course Evaluation

- 30 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance)
- 70 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks	1. Michael F. Drummond, Mark J. Sculpher, Karl Claxton, Greg L. Stoddart, and 2. George W. Torrance. Methods for the Economic Evaluation of Health Care Programmes. Oxford University Press. 4th edition 2015.
Main References (sources)	J. Lyle Bootman, Raymond J. Townsend, William F. McGhan: Principles of Pharmacoeconomics, 2nd edition. 1996.Cincinnati, OH: Whitney Books
Electronic References, Websites	https://www.cdc.gov/index.htm