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

Academic Program and Course Description Guide

2024

Academic Program Description Form

University Name: Uruk University
Faculty/Institute: College of Pharmacy
Scientific Department:
Academic or Professional Program Name: Bachelor of Pharmacy
Final Certificate Name: Bachelor
Academic System: Semester
Description Preparation Date: 2024
File Completion Date: 2024

Signature:
Head of Department Name:
Date:

Signature:
Scientific Associate Name: Dr. Hamoudi Aliwi Mousah
Date: 16-12-2024

The file is checked by: Dr. Reem Ghanim Hussien
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date: 16/12/2024
Signature:

جامعة كلية الصيدلة

Approval of the Dean
Prof. Dr. Yahya Yahya Farid
الاستاذ الدكتور
يحيى يحيى ركي فريد
عميد كلية الصيدلة
16/12/2024

1. Program Vision

The College of Pharmacy at the University of Uruk aspires to become a distinguished national and international center in the field of pharmaceutical education and scientific research, and to develop the capabilities and skills of its graduates through pharmaceutical development and innovation in service of society.

2. Program Mission

The College of Pharmacy is committed to the standards of quality and accreditation within national institutional institutions of higher education in Iraq, in terms of teaching and follow-up, enhancing the learning and scientific research environment, encouraging creative and critical thinking, communication skills for pharmacists, and the social responsibility resulting from the pharmacy profession.

3. Program Objectives

- Specializations: Developing students' skills, abilities, and creativity through quality education and training for their personal and professional development, and providing Iraqi society with qualified cadres in the public and private sectors.
- Enhancing effective communication skills that enable pharmacist graduates to work, produce, and develop in various fields.
- Instilling the concept of global multiculturalism in students and preparing them to interact effectively in an increasingly complex and rapidly changing global society.
- Promoting scientific research in various pharmaceutical specialties to find scientific solutions, correct the therapeutic path, ensure the optimal and safe use of medicine, and link research results to health development plans and the comprehensive vision of Iraqi society.
- Preparing students and attracting them towards specialized post-graduation programs to practice the best pharmacy profession in Iraq

4. Program Accreditation

National accreditation/National Council for Accreditation of Pharmacy Colleges is in progress

5. Other external influences

Practice sites- Office research - extracurricular activities - volunteer activities - other

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews**
Institution Requirements	**8**	**10**	**5.5**	**Basic**
College Requirements	**55**	**169**	**94.4**	**Basic**
Department Requirements	**/**	**/**	**/**	**/**
Summer Training		**Satisfied**		
Other	**/**	**/**	**/**	**/**

7. Program Description				
Year/Level	**Course Code**	**Course Name**	**Credit Hours**	
			theoretical	**practical**
Year 1, 1st semester	50304104	**Biology**	**2**	**2**
	50303103	Principles of pharmacy practice	2	----
	50102102	Analytical chemistry	3	2
	50301101	Medical terminology	1	----
	50304106	Mathematics and biostatistics	3	----
	50304105	Computer	----	2
	50404113	English language	2	----
Year 1, 2nd semester	50304111	Human anatomy	1	2
	50303108	Pharmaceutical calculations	2	2
	50304109	Medical physics	2	2
	50302107	Organic Chemistry I	3	2
	50304110	Histology	2	2
	50304112	Human Rights + Democracy	1	----
	50304105	Computers	----	2
Year 2, 1st semester	50302202	Organic chemistry II	3	2
	50304204	Microbiology I	3	2
	50303203	Physical pharmacy I	3	2
	50301201	Physiology I	3	2
	50304214	Computer	----	2
	5034205	Crimes of Baath system	1	----
Year 2, 2nd semester	50302207	Organic chemistry III	2	2
	50304209	Microbiology II.	3	2
	50303208	Physical pharmacy II	3	2
	5030120	Physiology II	3	2
	50306211	Pharmacognosy I	3	2

	50304215	Computer	----	2
	50304115	Arabic language	2	-----
Year 3, 1st semester	50302301	inorganic pharmaceutical chemistry I	2	2
	50306305	pharmacognosy II	2	2
	50303302	Pharmaceutical technology I	3	2
	50304304	Biochemistry I	3	2
	50304303	Pathophysiology	3	2
Year 3, 2nd semester	50302307	Organic Pharmaceutical Chemistry I	3	2
	50301306	Pharmacology I	3	----
	50303308	Pharmaceutical technology II	3	2
	50304309	biochemistry II	3	2
	50306311	Pharmacognosy III	2	2
	50305310	Pharmacy ethics	2	2
Year 4, 1st semester	50301401	Pharmacology II	3	2
	50302402	Organic Pharmaceutical Chemistry II	3	2
	50305405	Clinical Pharmacy I	2	2
	50303403	Biopharmaceutics	2	2
	50304404	Public health	2	---
Year 4, 2nd semester	50301406	pharmacology III	2	----
	50302408	Organic Pharmaceutical Chemistry III	3	-2-
	50305410	Clinical pharmacy II	2	2
	50301407	General toxicology	2	2
	50303409	Industrial Pharmacy I	3	2
	50305210	Communication skills	2	---
Year 5, 1st semester	50302502	Organic Pharmaceutical Chemistry IV	2	----
	50303503	Industrial pharmacy II	3	-2-
	50305506	Applied therapeutics I	3	----
	50304505	Clinical chemistry	3	-2--
	50304504	Training of clinical laboratories	---	4
	50301501	Clinical toxicology	-2-	2
		Graduation project	1	---
Year 5, 2nd semester	50305513	Pharmacoeconomics	2	------
	50305511	Applied therapeutics II	2	----
	50305512	Therapeutic drug	2	-2-

		monitoring		
	50302504	Advanced pharmaceutical analysis	3	2
	50305514	Hospital training	----	4
	50303508	Dosage form design	~~2~~--	----
	50303507	Pharmaceutical biotechnology	1	----

8. Expected learning outcomes of the program	
Knowledge	
1. Recognize the normal functions of the body and changes in these functions associated with disease conditions	To identify the human body and its organs and their functions in cases of health and disease from the anatomical and functional biochemistry and clinical aspects
2. Identify the drug as a chemical compound and identify its chemical and physical properties	Determine the effect of the drug's properties on its effectiveness and side effects
3. Identify the types of pharmaceutical dosage forms	How to determine the appropriate dosage form and methods of preparation and evaluate it in terms of effectiveness, therapeutic effect, side effects, stability and calculation of correct doses
4. Identify the different treatment options	Choose the right treatment for the pathological condition and the desired therapeutic effect
5. Understand the concepts of human rights and citizenship	The pharmacist is aware of his/her duties and rights as a good citizen of the society
6. Learn about the principles of medical statistics and medical physics	Knowledge of the basis for evaluating the results of clinical studies and economic studies of pharmaceuticals
7. Identify the mechanism of action of drugs, its side effects and their toxicity	Identification of drug interactions
Skills	
1. Working in laboratory environment	The student is able to safely handle laboratory equipment and reagents taking into account laboratory safety standards
2. Self-learning	The student is able to search for needed information and apply it
3. Providing the highest level of health care	The pharmacist is able to provide scientific and pharmaceutical consultations to the individuals in the health institutions and the community and provide treatment follow up
4. Provide safe and effective treatment	The pharmacist is able to diagnose medication errors in terms of the suitability of treatment for the pathological condition and the patient and the

	absence of interactions with other medications and with the general health condition of the patient
5. Communication with patients	The pharmacist is able to communicate with patients of different educational background, social status and health conditions
6. Communication with medical team members	The pharmacist can effectively communicate with the various medical staff such as the physician, nurse and others to correct medication errors, if any, and to make treatment recommendations based on scientific basis
7. Follow-up on the safety and effectiveness of the treatment provided to the patient	The pharmacist is able to apply the basic concepts of drug chemistry and pharmacology in interpreting drug interactions and providing pharmaceutical advice to medical staff and the community
8. Handling and dispensing of medications	The pharmacist is capable of educating the patient in the aspects of the use of different dosage forms, proper storage, and disposal
9. Preparation of pharmaceutical products and extemporaneous compounding	The pharmacist is able to prepare compounded dosage products in the pharmacy as needed and work in the pharmaceutical industry
Ethics	
1. Dealing with patients with the ethics of the pharmacy profession	The pharmacist maintains the privacy of the patient and makes the security and safety of the patient and the community the first goal of the pharmacy profession
2. Teamwork with other colleagues within the health care team in the work environment	The pharmacy student and the pharmacist deals with his classmates and colleagues in a team spirit

9 **Teaching and Learning Strategies**
● Presentations ● Interactive discussions ● Brainstorming ● Small groups ● Research ● Flipped classroom s ● Panel discussions ● Field visits to institutions and entities associated with the work of the pharmacist ● Voluntary work, seminars, workshops and exhibitions

10 **Evaluation methods**
● Individual and group assignments and reports ● Daily and weekly exams ● Assessment of practical skills

- Mid-term and final exams
- Graduation projects

11 **Faculty**						
Faculty Members						
Academic Rank	**Specialization**		**Special Requirements/Skills (if applicable)**		**Number of the teaching staff**	
	General	**Special**			**Staff**	**Lecturer**
Professor	1	1			2	1
Assistant Professor	2	3			5	0
Teacher	2	17			19	5
Assistant teacher	12	13			25	3

Professional Development

Mentoring new faculty members

- Teaching methods course
- Teaching validity course

Professional development of faculty members

Workshops, seminars and courses in:

- The methods and strategies of pharmaceutical education
- The basis for assessments and exam design
- Interactive education strategies
- Foundations and methods for updating and developing the curriculum

12 Acceptance Criterion

High school GPA and physical health as approved by the Ministry of higher Education and Scientific Research

13 The most important sources of information about the program

- **The College of Pharmacy, University of** Uruk **website, in Arabic and English**
- Official website of public universities / College of Pharmacy
- **Website of the Ministry of higher Education and Scientific Research**

- **The announcement boards and signs installed in the halls of the college**
- **Official documentation**

14	Program Development Plan

- Implementation objective structured clinical exam (OSCE) for all clinical pharmacy courses and related course
- Incorporate Active Learning Strategies
- Expand the use of technology in education
- Foster Research and Inquiry
- Develop Practical Skills
- Encourage Interdisciplinary Collaboration
- Professional Development for Faculty
- Further student-Centered Approach

Program Skills Outline																			
		Required program Learning outcomes																	
Year/Level	Course	Knowledge							Skills									Ethics	
		A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	B8	B9	C1	C2
First year	Biology	/							/	/			/	/				/	/
	Principles of pharmacy practice			/	/				/	/							/		/
	Analytical chemistry		/						/								/		/
	Medical terminology							/		/			/	/					/
	Mathematics and biostatistics						/			/				/					/
	Computer								/	/				/					/
	English language									/				/					/
	Human anatomy	/							/	/				/					/
	Pharmaceutical calculations			/	/				/	/							/		/
	Medical physics						/		/	/				/					/
	Organic Chemistry I		/							/							/		/
	Histology	/							/	/				/					/
	Human Rights + Democracy					/							/	/				/	/
	Computers								/	/				/					/
	Crimes of Baath party					/													

Second year	**Organic chemistry II**		/						/								/		/
	Microbiology I								/	/	/			/					/
	Physical pharmacy I		/	/					/	/							/		/
	Physiology I	/						/		/						/		/	/
	democracy					/							/	/				/	/
	Computer								/	/				/					/
	Organic chemistry III		/						/	/							/		/
	Microbiology II.								/	/	/			/					/
	Physical pharmacy II		/	/					/	/							/		/
	Physiology II	/						/		/						/		/	/
	Pharmacognosy I		/					/	/	/	/	/						/	
	Arabic language												/	/				/	/
	Crimes of Baath party					/													
Third year	**inorganic pharmaceutical chemistry I**		/					/	/	/							/		/
	pharmacognosy II	/						/	/	/	/	/						/	
	Pharmaceutical technology I			/					/	/	/					/	/	/	/
	Biochemistry I	/							/	/	/			/					/
	Pathophysiology	/							/	/				/					/

	Organic Pharmaceutical Chemistry I		/					/	/	/							/		/
	Pharmacology I			/	/								/	/	/	/		/	/
	Pharmaceutical technology II			/					/	/	/					/	/	/	/
	biochemistry II	/							/	/	/			/					/
	Pharmacognosy III		/					/	/	/	/	/						/	
	Pharmacy ethics					/							/	/				/	/
Fourth year	**Pharmacology II**		/	/			/		/			/	/	/	/			/	/
	Organic Pharmaceutical Chemistry II		/					/	/	/							/		/
	Clinical Pharmacy I	/			/			/			/	/	/		/	/		/	/
	Biopharmaceutics	/		/				/	/	/		/			/				/
	Public health	/			/		/				/							/	/
	pharmacology III									/				/					/
	Organic Pharmaceutical Chemistry III		/	/		/		/					/	/	/	/		/	/
	Clinical pharmacy II		/					/	/	/							/		/
	General toxicology	/			/			/		/	/	/	/	/	/	/		/	/
	Industrial Pharmacy I		/		/				/	/		/	/	/	/			/	/
	Communication skills		/	/			/		/	/							/		/
Fifth	**Organic Pharmaceutical Chemistry IV**		/					/		/									

year	**Industrial pharmacy II**		/	/			/	/	/								/		/
	Applied therapeutics I	/			/			/			/	/			/	/		/	/
	Clinical chemistry	/							/	/	/		/	/				/	/
	Training of clinical laboratories	/							/	/	/		/	/				/	/
	Clinical toxicology																		
	Graduation project	/								/									
	Pharmacoeconomics						/			/	/								/
	Applied therapeutics II	/			/			/			/	/			/	/		/	/
	Therapeutic drug monitoring			/	/			/			/	/		/	/			/	/
	Advanced pharmaceutical analysis		/	/					/	/									/
	Hospital training	/			/			/			/	/	/	/	/	/		/	/
	Dosage form design		/					/		/									
	Pharmaceutical biotechnology		/	/			/	/	/								/		/

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:

Principles of Pharmacy

2. Course Code:

50301105

3. Semester / Year:

1st Year / 1st Semester

4. Description Preparation Date:

February 2025

5. Available Attendance Forms:

In-Person

6. Number of Credit Hours (Total) / Number of Units (Total)

3 (2 Theoretical)

7. Course administrator's name (mention all, if more than one name)

Name:Dr. Sodad abdulhamid
Email: Sodadabdulhamid@uruk.edu.iq

8. Course Objectives

- **Introducing students to the history and development of pharmacy.**
- **• Understanding pharmaceutical dosage forms and their classifications.**
- **• Learning about drug sources and types of prescriptions.**
- **• Recognizing pharmacy departments and the pharmacist's roles.**
- **• Understanding labeling, storage, expiration, and drug interactions.**
- **• Introducing the basics of pharmaceutical legislation in Iraq.**

9. Teaching and Learning Strategies

Lectures
• Discussions

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**2**	Introduction to pharmacy and historical development	Introduction to pharmacy and historical development	Lecture and discussion	Participation

2	**2**	Dosage forms and routes of administration	Dosage forms and routes of administration	Lecture + examples	Quiz
3	**2**	Sources of drugs (natural, synthetic)	Sources of drugs (natural, synthetic)	Lecture + discussion	Oral questions
4	**2**	Types of prescriptions and interpretation	Types of prescriptions and interpretation	Lecture + workshop	Assignment
5	**2**	Midterm Exam	Midterm Exam	—	Written Exam
6	**2**	Pharmacy departments (hospital and community)	Pharmacy departments (hospital and community)	Lecture + visit	Report
7	**2**	Role of pharmacist in dispensing and compounding	Role of pharmacist in dispensing and compounding	Lecture + demonstration	evaluation
8	**2**	Drug labeling, storage and expiration	Drug labeling, storage and expiration	Lecture + cases	Short test
9	**2**	Introduction to pharmaceutical legislation	Introduction to pharmaceutical legislation	Lecture + summary	Final oral test

11. Course Evaluation

Midterm Exam: 25%
• Reports and Quizzes: 5%
• Final Exam: 70%
Total: 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Pharmaceutical Calculation ,Howard CAnsel,13 th Edition201 Wolters Kluwer Lippincott Willia &Wilkins

Course Description Form

1. Course Name:
Human Biology
2. Course Code:
50304104
3. Semester / Year:
1st Year / 1st Semester
4. Description Preparation Date:
February 2025
5. Available Attendance Forms:
In-Person
6. Number of Credit Hours (Total) / Number of Units (Total)
4hr/ 4 unit
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Shahab Abdulrahman, Dr. Nadia Tariq, Ms. Abeer Essa, Ms. Sa Nami, Ms. Fatima Sabah Email: Shihababdelrahman@uruk.edu.iq nadiashuber@gmail.com Abeeressa@uruk.edu.iq safa.ali2306@sc.uobaghdad.edu.iq fsj0068@gmail.com
8. Course Objectives
• 1. **1. Understand the basics of human biology and the structure of various tissu** • 2. **2. Provide comprehensive information on human cells and tissues.** • 3. **3. Learn the structural basis of body systems and how organs function a relate to each other.**
9. Teaching and Learning Strategies
• Verbal explanation of facts and scientific information. • Interactive discussion using scientific terms and visual aids (slides, PowerPoint). • Using computer software and internet-based educational tools. • Direct classroom discussion and practical labs.
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**2**	Introduction to Human Biology	Understand biological levels of organization	Scientific discussion + visual aids	Oral quizzes + group questions
2	**2**	Nutrition - Part I	Understand definition and components of nutrition	Scientific discussion + visual aids	Oral quizzes
3	**2**	Nutrition - Part II (Digestion)	Understand digestive system and its role in nutrition	Scientific discussion + visual aids	Written and oral assessment
4	**2**	Cell structure	Understand types and functions of cells	Scientific materials + slides	Oral quizzes
5	**2**	Cell biology	Understand cell division, fertilization, and embryonic development	Scientific discussion + presentations	Written and oral assessment
6	**2**	Tissues - Part I	Identify epithelial and connective tissues	Scientific discussion	MCQ quizzes
7	**2**	Tissues - Part II	Identify muscular and nervous tissues	Scientific discussion	Written and oral assessment
8	**2**	Glandular System	Learn gland types and structures	Scientific explanation	Oral quizzes
9	**2**	Hormones and Reproductive System	Understand hormone function and reproduction	Scientific discussion	Written and oral assessment
10	**2**	Immune System	Understand immune system and its components	Scientific materials + discussion	MCQ assessment
11	**2**	Digestive System	Identify digestive organs and their functions	Scientific discussion + slides	Written and oral assessment
12	**2**	Circulatory System	Understand heart and blood circulation	Scientific explanation	Oral quizzes
13	**2**	Final Exam Review	Prepare for final exam	Discussion and revision	Oral and written review

11. Course Evaluation

Midterm Exam: 20%
• Reports and Quizzes: 20%
• Final Exam: 60%
Total: 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	A Textbook of Human Biology by J. K. Inglis + other recommended academic resources and journals

Course Description

.1 Course Name
Analytical Chemistry
.2 Course Code:
103021112
.3 Semester / Year:
First semester 2024-2025
.4 Date of Course Description Preparation
September 2024
.5 Available Attendance Mode
On campus
.6 Total Hours / Total Units:
45 / 4
.7 Course Coordinator Name:
Assist. Prof. Najeeb Butrus Al-sabea **Najib.butrus@gmail.com**
.8Course Objectives
• Providing students with scientific experience of analytical chemistry with various methods of neutralization reactions. • Study the effect of acidity on various reactions of simple and complex compounds. • The mechanism of qualitative analysis and its importance in various fields of life, including pharmaceutical applications. • Detection of compounds by a number of methods using sedimentation titration, complex formation titration, and oxidation-reduction titration.
.9 Teaching and Learning Strategies
1- Theoretical lectures covering all aspects of each method 2- Conduct reports on the applications of the methods mentioned above on chemical compounds and pharmaceutical preparations 3- Showing applied videos to help understand the material 4- Use methodological and supporting books 5- Holding scientific sessions in the form of discussions or seminars

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
١	٤	Strong and weak electrolytes. Weight and focus are important devices	Review the importan basic concept of analytical chemistry	lecture	Oral exam and discussions
٢-٥	١٠	Statistical analysis of data. Reject sedimentary and gravimetric data and methods	Evaluation of gravimetric analysis methods	lecture	Oral exam and discussions
٦	٤	Organic and inorganic sediments	Scope of applications gravimetric analysis	lecture	Oral exam and discussions
٧-٨	٥	Volumetric methods: acid-base neutrality calculations, and acid exponent calculation	Introduction to volumetric analysis methods	lecture	Oral exam and discussions
٩	٣	Chemical neutralization reactions	Dielectric solutions	lecture	Oral exam and discussions
١٠-١١	٥	Details of precipitation methods	Complex system neutralization Theory	lecture	Oral exam and discussions
١٢	٤	Volumetric methods for complex systems	Calculate the pH in a complex system	lecture	Oral exam and discussions

١٣-١٤	٦	Oxidation and reduction reactions	Equilibrium in the redox system	lecture	Oral exam and discussions
١٥	٤	Various spectroscopic methods: enumerating their types and devices	Spectroscopic analys	lecture	Oral exam and discussions

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Fundamentals of Analytical Chemistry by Skoog and West
Main references (sources)	Fundamentals of Analytical Chemistry by Skoog and West
Recommended books and references (scientific journals, reports...)	mentioned above
Electronic References, Websites	Google , ResearchGate

Course Description Form

1. Course Name:

Mathematics and Biostatistics

2. Course Code:

503 04 1 06

3. Semester / Year:

First /First

4. Description Preparation Date:

١٨/٩/2024

5. Available Attendance Forms:

In-person attendance

6. Number of Credit Hours (Total) / Number of Units (Total):

3/3

7. Course administrator's name (mention all, if more than one name)

abdulqader faris
abdulqaderfaris@gmail.com

8. Course Objectives

Course Objectives	The aim is to enable students to apply mathematical statistics in pharmaceutical science, use biostatistics in specific pharmaceutical courses, calculate the odds ratio and relative risk of an event, estimate statistical population indicators, and develop alternative hypotheses.

9. Teaching and Learning Strategies

Strategy	1-Lectures and Presentation 2-Discussions 3- Laboratory application 4- Inverted classrooms

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	The difference between biostatistics and descriptive statistics	Fundamentals of biostatistics and descriptive statistics	- Lectures -White board -Data show -Power point -Explanatory diagrams -Scientific YouTube videos -Laboratory experiments	-Written exams - Oral exams -Laboratory reports
2	3	Extracting the percentage	Fundamentals of probability theory	=	=

		probability of a specific event occurring and determining the risk ratio			
3	3	Continuous probability distributions and the relationship between the discrete binary distribution and the continuous normal distribution	The sample distribution	=	=
4	3	The field of the function, types of mathematical functions and graphing functions	Mathematical functions	=	=
5	3	Exploring the properties of logarithm and exponential functions	Logarithm and exponential functions	=	=
6	3	Learn about derivation and integration in pharmaceutical fields	Integration and differentiation	=	=
7	Midterm Examination				
8	3	Linking the calculation of the area under the curve to drug kinetics	Applications of the area under the curve	=	=
9	3	Identify the appropriate sample size	Samples and confidence intervals	=	=

		and what are the null and alternative hypotheses			
10	3	Knowing the relationships between dependent and independent variables	Dependent and independent variables	=	=
11	3	To know the difference between a sample and a standard value	Correlation and regression	=	=
١٢	3	To know the difference between , the two samples To find out the significant differences between the groups	One-sample tests and Two-sample tests	=	=
١٣	3	To find out the significant differences among the groups	Analysis of variance tests	=	=
١٤	3	Parametric and non-parametric tests	Choices in the domain of non-normal distribution	=	=
15	3	To know the relationship between categorical variables	Correlation test for categorical variables	=	=
11. Course Evaluation					
Midterm examination 30 Marks Final examination 70 Marks					

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Calculus, Third Edition, by Gilbert Strang. Introductory Statistics Using SPSS, Second Edition, by Herschel Knapp.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Introductory Biostatistics for the Health Sciences, by Michael R. Chernick.
Electronic References, Websites	

Course Description Form

1. Course Name:
Computer Sciences
2. Course Code:
50304105
3. Semester / Year:
First/First
4. Description Preparation Date:
19/9/2024
5. Available Attendance Forms:
In-person attendance
6. Number of Credit Hours (Total) / Number of Units (Total):
2/1
7. Course administrator's name (mention all, if more than one name)
Mohammed Hamed mohammedhammed@gmail.com

8. Course Objectives	
Course Objective	The course is designed to provide a thorough overview of the fundamental concepts of computer applications. It covers the use of Microsoft Word, Microsoft Power point, and Google applications in detail.
9. Teaching and Learning Strategies	
Strategy	1-Lectures and Presentation 2-Discussions 3- Laboratory application 4- Inverted classrooms

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Using Google applications	Introduction to Microsoft Word (File and Home Tab)	- Lectures -Power point presentations	-Written exams - Oral exams -Laboratory reports

				-Scientific YouTube videos -laboratory experiments	
2	2	Use the tape to insert mathematical equations and graphs	Insert tab	=	=
3	2	Use tape to layout the paper	Layout Tab	=	=
4	2	The References Tab allows you to now create a table of contents, footnotes, citations, cross-references	References Tab	=	=
5	2	Use the Mailing Bar to send	Mailings Tab	=	=
6	2	The use of tape in the meanings of paper and the use of tools in translation	Review Tab	=	=
7	Midterm examination				
8	2	The use of tape in the meanings of paper and the use of tools in translation	View Tab	=	=
9	2	Create, edit, save, and print presentations	Introduction to Microsoft PowerPoint	=	=
10	2	Create, edit, save, and print presentations	File and Home Tab	=	=

11	2	Add a graphic to a presentation. Create slide presentations that include text, graphics, animation, and transitions	Insert tab	=	=
12	2	Use design layouts and templates for presentations.	Design	=	=
13	2	Control the speed, add sound, and customize the look of transition effects.	Transition Tab, Slide View	=	=
14 and 15	4	The most common types of animation effects include entrances and exits. Adding sound to increase the intensity of the animation effects.	Animation Tab , Review Tab , View Tab	=	=

11.Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily practical, monthly practical or written exams, and reports	
12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Microsoft office Professional 2019, BY Linda Foulkes, Senior Editor: Afshaan Khan ISBN 978-1-83921-725-8
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Microsoft office Professional 2010, BY Joyce Cox, Jo an Lambert & Curtis Frge
Electronic References, Websites	

Course Description Form

1. Course Name:
Pharmaceutical calculation
2. Course Code:
50303108
3. Semester / Year:
1st Year / 1st Semester
4. Description Preparation Date:
February 2025
5. Available Attendance Forms:
In-Person
6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name:dr. Mohammed lith dr. sodad abdulhamid . dr. mokhis monther Email:drmohammedlaith87@gmail.com mukhlesmunther1999@ gamil.com sodadabdulhamed@gmail.com
8. Course Objectives
• **Introducing students to the history and development of pharmacy.** • **• Understanding pharmaceutical dosage forms and their classifications.** • **• Learning about drug sources and types of prescriptions.** • **• Recognizing pharmacy departments and the pharmacist's roles.** • **• Understanding labeling, storage, expiration, and drug interactions.** • **• Introducing the basics of pharmaceutical legislation in Iraq.**
9. Teaching and Learning Strategies
Lectures • Discussions
10. Course Structure

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

1	**2**	Introduction to pharmacy and historical development	Introduction to pharmacy and historical development	Lecture and discussion	Participation
2	**2**	Dosage forms and routes of administration	Dosage forms and routes of administration	Lecture + examples	Quiz
3	**2**	Sources of drugs (natural, synthetic)	Sources of drugs (natural, synthetic)	Lecture + discussion	Oral questions
4	**2**	Types of prescriptions and interpretation	Types of prescriptions and interpretation	Lecture + workshop	Assignment
5	**2**	Midterm Exam	Midterm Exam	—	Written Exam
6	**2**	Pharmacy departments (hospital and community)	Pharmacy departments (hospital and community)	Lecture + visit	Report
7	**2**	Role of pharmacist in dispensing and compounding	Role of pharmacist in dispensing and compounding	Lecture + demonstration	evaluation
8	**2**	Drug labeling, storage and expiration	Drug labeling, storage and expiration	Lecture + cases	Short test
9	**2**	Introduction to pharmaceutical legislation	Introduction to pharmaceutical legislation	Lecture + summary	Final oral test

11. Course Evaluation

Midterm Exam: 25%
• Reports and Quizzes: 5%
• Final Exam: 70%
Total: 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Pharmaceutical Calculation ,Howard CAnsel,13 th Edition201 Wolters Kluwer Lippincott Willia &Wilkins

Course Description Form

1. Course Name:
Human anatomy
2. Course Code:
50304111
3. Semester / Year:
Second/ First
4. Description Preparation Date:
١9/٩/2024
5. Available Attendance Forms:
In-person attendance
6. Number of Credit Hours (Total) / Number of Units (Total):
3/2
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Shahab Abdulrahman, Dr. Nadia Tariq, Ms. Abeer Essa, Ms. Safa Nami, Ms. Fatima Sabah Email: Shihababdelrahman@uruk.edu.iq nadiashuber@gmail.com Abeeressa@uruk.edu.iq safa.ali2306@sc.uobaghdad.edu.iq fsj0068@gmail.com

8. Course Objectives	
Course Objectives	• Learning the names and functions of anatomical structures. • Illustration of how anatomic systems work together. • Provide comprehensive understanding of how abnormal anatomy can lead to disease.
9. Teaching and Learning Strategies	
Strategy	• Presentation and recitation • Interactive discussions • Brainstorming • Research and induction

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	General introduction about human anatomy science ,types of anatomy study (regional ,systemic) ,difference between	Anatomy: general introduction	Lectures; Discussions and Reports	Exam and classroom activities

		histology and anatomy, directional terms ,body cavities ,body quadrants			
2	1	The axial skeletal system, facial bones, skull bones, vertebral column bones, study the structure of vertebrae	Anatomy of the skeletal system: Axial system	=	=
3	1	The structure and function of appendicular skeletal system and the major bones ,the shoulder girdle, upper arm bones, pelvic girdle bones and the differences between man and woman girdle, palm bones, lower extremities bone (femur ,tibia and fibula bones), ankle bones	Anatomy of the skeletal system: Appendicular system	=	=
4	1	The structure and function of joints, types of joints (movable and non-movable), components of joints, some types of synovial joints (shoulder joint, ankle joint, pelvic joint)	Anatomy of the joints	=	=
5	1	The muscles, facial muscle, major function of muscles, muscle and facial expression, and major neck muscles	Anatomy of the muscles-1	=	=
6	1	The appendicular muscles, abdominal muscles, upper extremities muscles, lower extremities muscles	Anatomy of the muscles-2	=	=
7	Midterm examination				

8	1	The heart and its chambers, left and right atrium, left and right ventricle, valves of heart, the arteries, the veins, blood capillaries, the lymphatic vessels	Anatomy of the cardio-vascular system	=	=
9	1	The central and peripheral nervous system, brain and its parts (cerebellum, cerebrum, hypothalamus), spinal cord, peripheral nerves types, anatomic nervous system (sympathetic and parasympathetic)	Anatomy of the nervous system	=	=
10	1	The respiratory system (nose ,pharynx , larynx, trachea, bronchial tree, muscle of respiration (diaphragm, intercostalis muscle)	Anatomy of the respiratory system	=	=
11	1	The anatomy of teeth and their classification ; digestive tract (mouth, pharynx, esophagus, stomach, small intestine, large intestine); accessory glands of the digestive system	Anatomy of the digestive system	=	=
12	1	The urinary system structures, the kidney, nephrons, glomeruli, afferent and efferent blood vessels, urinary bladder, urethra , and ureter	Anatomy of the urinary system	=	=

13		Types and location of glands, types of secretions and structures within each gland	Anatomy of the endocrine system	=	=
14		Male reproductive system organs; female reproductive system organs	Anatomy of the reproductive system	=	=
15	1	Skin layers and epidermal appendages	Anatomy of the integumentary system	=	=

11.Course Evaluation
Midterm examination 20 marks Practical part 20 marks Final examination 60 marks

12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Anatomy and Physiology for Healthcare by Paul Marshall; Beverly Gallacher; Jim Jolly; Shupikai Rinomhota
Main references (sources)	Atlas of Human Anatomy by Frank H. Netter
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	Understanding anatomy & physiology [electronic resource] : a visual, auditory, interactive approach

.1 Course Name
Organic chemistry
.2 Course Code:
50302202
.3 Semester / Year:
1st semester/ 2024-2025
.4 Date of Course Description Preparation
May 2025
.5 Available Attendance Mode
Attendance
.6 Total Hours / Total Units:
4/45
.7 Course Coordinator Name:
Dr. Ammar Abdullwahabe Muslim Alsultany **yahooammar@gmail.com** **Assistant Lecturer Ahmed Hammodi Hamdi** **ahmedhahmedhh@gmail.com** **Assistant Lecturer Zahraa Mokhtar** **zahramokhtar98@gmail.com** **Assistant Lecturer Rasha Tariq** **rasha.tariq.salim@gmail.com** **Assistant Lecturer Hanen Ahmed** **hanen.amjed345@gmail.com**
.8Course Objectives
- AromaticHydrocarbons(includesbenzene,electrophilicaromaticsubstitution,arenasandtheir derivatives). (10 hours) - Carboxylic acids :properties and reactions. (5 hours) - Functional derivatives of carboxylic acids. (7 hours) - Amines I and II. (6 hours) - Aldehydes and ketones (include also aldol and Claisen condensation);Classification, reactions and properties. (12 hours)

- Phenols. (5 hours)

.9 Teaching and Learning Strategies

To enable students to understand the chemistry of carbon, and the classification ,properties and reactions of organic compounds. It includes understanding the basic structure and properties of organic halides, carboxylic acids, aldehydes, ketones and amines, in addition to the principles and application of stereo chemistry on these compounds.

.10 Course Structure

Course Description

Week	Topic	Key Learning Outcomes	Hours
1	- Aromatic Hydrocarbons (includes benzene ,electrophilic aromatic substitution , arena sand their derivatives).	The results are acceptable and will be determined after student evaluation and practical teaching.	10
2	Carboxylic acids :properties and reactions.	The results are acceptable and will be determined after the students are evaluated.	5
3	Functional derivatives of carboxylic acids.	The results are acceptable and will be determined after student evaluation and practical teaching.	7
4	Aldehydes and ketones (include also aldol and Claisen condensation) ; Classification , reactions and properties.	The results are acceptable and will be determined after the students are evaluated.	12
5	Amines I and II.	The results are acceptable and will be determined after student evaluation and practical teaching.	6

Week	Topic	Key Learning Outcomes	Hours
6	Phenols.	The results are acceptable and will be determined after the students are evaluated.	5

12. Teaching and Learning Resources:

- Required Textbooks

All educational supplies are fully applied, especially in the practical aspect of laboratories

- **Main References**

Organic Chemistry by Robert T. Morrison and Robert N.Boyd.

- OrganicChemistrybyMcCurry;5thed.;Thomasonlearning;CA,USA2000.

- Recommended Readings

Course Description Form

1. Course Name:	
Histology	
2. Course Code:	
50304110	
3. Semester / Year	
Second/First	
4. Description Preparation Date:	
١٩/٩/2024	
5. Available Attendance Forms:	
In-person attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
4/3	
7. Course administrator's name (mention all, if more than one name)	
dr.samer hamid dr.sala jafer dr. abeer essa dr.fatima sabah	drsamerhamid@gmail.com salajafer@gmail .com abeeressa@gmail.com fsj0068@gmail.com
8. Course Objectives	
Course Objectives	- Describe the basic concepts of general human histology at the normal cellular, histological and ultrastructural levels - To acquire a basic background in histology and to understand the properties of cells and their interactions with one another as components of tissues and organs - To be able to describe the normal structure and function of various cell types, tissues, and organs, and to differentiate their histological structures from each other through microscopic examination.
9. Teaching and Learning Strategies	
Strategy	- Lectures - Discussions - Electronic classes - Reports

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	General introduction of histology course and its relationship with biology anatomy and pathophysiology. Outline the principles of histology, histochemistry and immunohisto-chemistry. Outline the scope of terms used in histology The practical part describes the method of tissue preparation for histological examination and outlines the different steps taken to prepare a biopsy specimen for visualization Furthermore, describes the function of the different types of microscopes utilized in histology	Introduction to histology	Lectures, Discussions, and Reports	Exams and classroom activities
2	2	Outline the histological features of plasma membrane, and cellular organelles correlating them with their function. Describe the membranous and	Cell and tissue structure	=	=

		non-membranous organelles of the cell. Define the histological characteristics of normal and an apoptotic cell. Identify the different stages of mitosis and meiosis from microscopic images. Explain the distinguishing features of the four major tissue types (epithelial, connective, muscle, nervous). List the different types of epithelial cells and briefly discuss the function of each (apical, lateral, basal). Describe the accessory structural features of epithelial cells such as microvilli, cilia and cell-to-cell contacts. The practical part emphasis the identification of the different types of epithelial tissue under the microscope			
3	2	List the classification of connective tissue and description of the major	The connective tissue histology	=	=

		histologic features of each class. Describe the different components of the ECM and their microscopic features. Briefly discuss the characteristics of special connective tissue. The practical part is concerned with identification of the different types of connective tissue under the microscope.			
4	2	Describe the histology and function of the different layers of the heart. Outline the different microscopic features of arteries and veins. Identify the differences between different types of arteries and veins. The practical part is concerned with identifing heart tissue and distinguish between artery and vein in a tissue microscopic specimen.	The cardiovascular system histology	=	=
5	2	Describe the histology of the	The respiratory system histology	=	=

		conducting portion of respiratory system (nasal cavity, pharynx, larynx, trachea, bronchi). Discuss the histology of the respiratory portion of the system (intrapulmonary bronchial tree, bronchioles, and alveoli). The practical part is concerned with the distinguish between the trachea, bronchi and bronchiole in a microscopic specimen.			
٦	2	Describe the histology of oral cavity, esophagus, stomach, and small and large intestine Describe the structure of the liver with regards to functional units (lobule vs acinus). Describe the zonal distribution of hepatocytes and its functional significance. Outline the major morphological features of the gallbladder and pancreas. The practical part is concerned with Identify the microscopic	Digestive system histology	=	=

		architecture of the liver based on the lobular and acinus model. Identify the histological features of the gallbladder and the pancreas.			
7	Midterm examination				
8	2	Describe the major histological features of the pituitary gland, hypothalamus and pineal gland. Outline the three classes of hormones secreted by the endocrine system. Describe the general mechanism of hormone secretion regulation. The practical part is concerned with the microscopic structural differentiation of pituitary, thyroid and parathyroid glands' cells.	The endocrine system histology	=	=
٩	2	Describe the histology and function of the kidneys , ureters, urinary bladder and urethra.	The urinary system histology	=	=

		Describe the major histological constituents and features of nephrons. Describe the major histological constituents and functions of juxtaglomerular apparatus. The practical part is concerned with the identification of the microscopic architecture of the kidney, ureter, urinary bladder.			
10	2	Describe the major histological features and general function of the central and peripheral nervous system. Describe the histology of the cerebrum, cerebellum and spinal cord. Describe the histology of the nerve and ganglia. Outline the major differences between neuron and glial cells. The practical part is concerned with the identification of the microscopic architecture of cerebrum, cerebellum, spinal cord, nerve and ganglia.	The nervous system histology	=	=

١١	2	Describe the major histological features and general function of the lymphatic system (central and peripheral organs). Describe the histology of the spleen, lymph node and thymus gland. The practical part is concerned with the identification of the microscopic architecture of spleen, lymph node and thymus gland.	The lymphatic tissue histology	=	=
12 and 13	٤	Describe the histological features of ovaries, ovarian duct, and uterus. Describe the histological features of testes,conducting ducts, and the associated glands	The reproductive system histology	=	=
14	2	Describe the histological features of the skeleton, skeletal muscles, ligaments, tendons, joints, cartilage and other connective tissues. The practical part is concerned with the identification of the microscopic architecture of skeletal muscles, ligaments, tendons, joints, and cartilage.	Musculoskeletal system histology	=	=

15	2	Outline the different cell types found in the blood and describe their morphological features. List the different stages of haemopoiesis in bone marrow . The practical part is concerned with the identification of the microscopic architecture of erythrocyte, WBCs and thrombocytes, and bone marrow.	Blood histology	=	=

11. Course Evaluation	
Midterm examination 20 marks Practical 20 marks Final examination 60 marks	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Basic Histology: text and Atlas, 11th ed. BY Luiz Carlos, Uchoa Junqueria 2005
Main references (sources)	Wheaters functional histology: a text and colour atlas 6th ed. BY Yung , Barbara 2013
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

.1 Course Name
Medical Physics
.2 Course Code:
110 ClMp
.3 Semester / Year:
Second semester 2024-2025
.4 Date of Course Description Preparation
September 2024
.5 Available Attendance Mode
In person
.6 Total Hours / Total Units:
3/5
.7 Course Coordinator Name:
Assist. Lec. Noor Al-huda Haider nooarahr97@gmail.com
.8Course Objectives
The course aims to introduce the student to the principles of medical physics, the spectrum of electromagnetic waves, ionizing and non-ionizing radiation and their interaction with biological matter, and medical imaging.
.9 Teaching and Learning Strategies
1- 1-Lectures and Presentation 2-Discussions 3- Laboratory application 4- Inverted classrooms

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evalua meth
1 and 2	4	General concepts in physics and the laws of thermodynamics. Thermodynamics systems properties; conservation of energy principle; application of thermodynamics; the Zeroth law.	General concepts	- Lectures -White board -Data show -Power point -Explanatory diagrams -Scientific YouTube videos -Laboratory experiments	-Written ex - Oral exan -Laboratory reports
3 and	4	Pressure; temperature and	Pressure, heat,	=	=
		(Celsius, Fahrenheit, Kelvin); equation of state; ideal gas and real gas; general law of gases; clauses equation and Vander Waales equation; equilibrium and types of equilibrium; compressibility factor, coefficient of volume expansion, elastic coefficient (bulk modulus).			
5 and 6	4	Radiation: Kirshoffs law; planks law; Stefan-Boltzman law; Wiens law; Black body and Albedo; Heat transfer (radiation, convection, conduction).	Radiation	-	-
7	Midterm examination				
8	2	Forces in the body, type of forces, forces on the body, sedimentation, medical applications of sedimentation.	Forces	-	-
9	2	Optics and human vision; the physics of the eye and vision; light; lens; electromagnetic spectrum; medical applications of the electromagnetic spectrum	Optics, and their medical applications	-	-
10 and 11	4	Energy and power of the body; conservation of energy; energy change in the body; work and power; the process of metabolism	Power and energy medical applications	-	-
12-15	8	General properties of sound; the human ear; the range of human hearing; ultrasound; types of ultrasound; intensity of ultrasound; acoustic impedance; interactions of ultrasound with matter. Diagnostic ultrasound;	Sound medical applications	-	-

		biologic effect of ultrasound.			

11. Course Evaluation	
Midterm examination 20 marks Practical part 20 marks Final examination 60 marks	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1- Physics for Biology and Medical Students, 2nd ed. Paul Davidovits 2-Practical Physics by William Watson
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Medical Terminology
2. Course Code:
50301101
3. Semester / Year:
2024–2025
4. Description Preparation Date:
10–9–2024
5. Available Attendance Forms:
in class
6. Number of Credit Hours (Total) / Number of Units (Total)
20
7. Course administrator's name (mention all, if more than one name)
Asst. Lecturer Dr. Ghasak Kais Email: ghasak.kais@uruk.edu.iq

8. Course Objectives	
Course Objectives	1-Distinguish common medical abbreviations and acronyms. 1-Choose and define medical terms from appropriate sources. 3-Summarize medical/clinical related materials.

9. Teaching and Learning Strategies	
Strategy	○ • Distinguish common medical abbreviations and acronyms.

	○ **Encourage students to pronounce terms out loud in context** ○ **Offer multimedia-rich course materials** ○ **Use flashcards for memorization** ○ **Customize the curriculum to student learning**

10. Course Structure

In class questions, exams	In-Class-Online	**Lymphatic and immune system**	Students will be able to identify the most important terminologies for the lymphatic and immune system	1	12
In cl questions exams	In-Class-Online	**Lymph ic a immun system**	Students will able to ident the m important terminologie for lymphatic a immune syst	1	12

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Medical Terminology: A Text/Workbook (4th Edition)

	Introduction to Medical Terminology, 1st Edition
Main references (sources)	Medical Terminology: A Text/Workbook (4th Edition) Introduction to Medical Terminology, 1st Edition
Recommended books and references (scientific journals, reports…)	• Basic Medical Language. • Medical Language for Modern Health Care. • Mastering Healthcare Terminology. • Medical Terminology for Health Care Professionals. • Medical terminology for dummies
Electronic References, Websites	

1. Subject
Human rights
2. symbol
50304112
3. semester/ year
First semester/First year
4. Date
٢٠٢٤/٩/١٩
5. Attendance type
Physical attendance
6. Total hours /Total value
١/١
7. Lecturer's name
dr. saad mohsin saadmohseen@gmail.com
8. Aims of syllabus

1-Introducing students to human rights and their most prominent characteristics, their sources, and stages. 2- The historical overview of human rights. 3- Learn how to exercise political rights. 4- Learn the Universal Declaration of Human Rights and the international charters and treaties that focus on human rights.	bjectives of study subject

9- Teaching and learning strategies

Strategies

- Presentation and recitation
- Interactive discussions
- Brainstorming
- Research and induction

10- the contents of syllabus

Techniques of evaluation	Procedures	Topics	Objectives	Hour No.	Week
Oral test and Classroom activities	Lecture and discussion	Concept of freedom	Identifying the development of the concept of freedom over time	١	١
=	=	Civil and political rights	Learning about the civil and political rights	١	٢
=	=	Types of human rights in international law	Recognizing the social , economic and cultural rights	١	٣

=	=	Woman's and children's rights	Learning about the rights of groups and individuals	١	٤
=	=	human rights in ancient civilizations	Discussing the concept of human rights in ancient civilizations	١	٥
=	=	the differences of rights in religions	Discussing the differences of rights in religions	١	٦
Mid-year Exam					٧
=	=	Human rights in Iraqi constitution	Discussing human rights in Iraqi constitution	١	٨
=	=	the similarities and differences in women's rights between Islamic teachings and law	Discussing the similarities and differences in women's rights between Islamic teachings and law	١	٩
=	=	women's rights in Islam	Learning about women's rights in Islam	١	١٠
=	=	Universal Declaration of Human Rights	Learn about the Universal Declaration of Human Rights	١	١١

=	=	Human rights in the middle ages	Learning about human rights in the middle ages	١	١٢
=	=	Political rights guarantees	Discussing political rights guarantees	١	١٣
=	=	Legal rights guarantees	Discussing legal rights guarantees	١	١٤
=	=	social rights guarantees	Discussing social rights guarantees	١	١٥

9. The evaluation

Mid-term exam: 30 marks

End-of-semester exam: 70 marks

10.References

1. **Maher Saleh,*Democratic human and child rights***	**Syllabus**
2. **Hamid Hanoun, *Human Rights***	**Books**
3. **Nawaf Kanaan ,*Human rights in Islam, international conventions, and Arab constitutions by***	**Journals , periodic and articles**
	e-books and websites

Course Description Form

1. Course Name:
Organic Chemistry III
2. Course Code:
103022211
3. Semester / Year:
Second semester/ ٢٠٢٤-٢٠٢٥
4. Description Preparation Date:
September / 2024
5. Available Attendance Forms:
on campus
6. Number of Credit Hours (Total) / Number of Units (Total)
٣٠ hours/ 3 units
7. Course administrator's name (mention all, if more than one name)
Name: **May Mohammed Jawad Al- Mudhafar** Email**:** may.mj.almudhafar@copharm.uobaghdad.edu.iq Name: **Maadh Qusay Abdulkadir** Email: Moaz.Abd@copharm.uobaghdad.edu.iq Lab instructors Name: **Azhar Mahdi Jasim** Email: azharmjk@copharm.uobaghdad.edu.iq Name: **Sumayah Saadi Abbas** Email: sumayah.saadi@copharm.uobaghdad.edu.iq Name: **Nedaa A. Hameed A. Rahim** Email: nedaarahim@copharm.uobaghdad.edu.iq
8. Course Objectives

Course Objectives	1-Studying the basics of heterocyclic chemistry for some rings containing nitrogen, sulfur and oxygen which are considered the foundations of the study of pharmacy (like studying pyrrole, furan, thiophene, pyridine, quinoline and isoquinoline) and properties, nomenclature, reactions and preparations. 2-Studying methods for the qualitative detection of various compounds containing heterogeneous rings, such as drugs and organic compounds.

	3- Studying the importance of heterocyclic compounds that having numerous applications in pharmaceutical chemistry and play a key role in biochemical functions. A lot of heterocycles are employed in medicine as medications to treat a variety of ailments and injuries.

9. Teaching and Learning Strategies

Strategy	**Knowledge** **1**-Increase knowledge of the basic principles of heterocyclic chemistry. **2**-Studying the methods of chemical reactions related to heterogeneous rings. **3**-Conducting practical experiments to detect the elements that make up heterogeneous rings. **4**-Correct handling of chemicals and glass tools during diagnosis and identification of heterogeneous rings. **5**-The importance of heterocyclic in our life, their presence in nature, in plants, and in our bodies. **Skills** **1**-Gain the skill on how to recognize heterogeneous rings **2**-Gaining the skill on how to detect heterogeneous rings **3**-Gain skill on how to write the practical reports. **Learning and teaching methods** 1-Theoritical lectures 2-running practical experiments 3-scientific research 4-Methodical and supporting books 5-Scientific discussions and seminars

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	5	Heterocyclic organic compounds naming, classification, propertie and chemical structure	Heterocyclic compoun Introduction	Lectures	quizzes

3-5	5	Five-membered heterocyclic organ compounds, sources and preparati	Five heterocyclic compounds, that containir one heteroatom, furan thiophene, and pyrrole.	Lectures	Oral discussio
6-8	5	Five-membered heterocyclic organic compounds, reactions	Five heterocyclic compounds, furan thiophe and pyrrole reactions	Lectures	quizzes
9-10	4	Six-membered heterocyclic organic compounds, naming, sources and preparation, pyridine	Six-membered heterocyclic, introduction	Lectures	Oral discussio
11-13	6	Saturated five-membered heterocyclic organic compounds, sources and preparation	Saturated five-membered heterocyclic organic compounds, introduction	Lectures	quizzes
14-15	5	Two heteroatoms, containing five-membered heterocyclic compounds; types of, synthesis, and reactions.	Organic compounds, Five-membered rings of two-heteroatom	Lectures	quizzes

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 marks for practical work in the lab and quizzes

20 marks for mid-term exam and quizzes and oral discussions

60 marks for final term exam

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	*Organic Chemistry by Robert T. Morrison and Robert N. Boyd. *Organic Chemistry by McCurry; 5th ed. Thomason learning; CA,US 2000 *An introduction to the chemistry of heterocyclic compound by Acheson, R. M. latest ed.
Main references (sources)	*Organic Chemistry by Robert T. Morrison and Robert N. Boyd. *Organic Chemistry by McCurry; 5th ed. Thomason learning; CA,US 2000 *An introduction to the chemistry of heterocyclic compound by Aches R. M. latest ed.
Recommended books and references (scientific journals, reports…)	Organic Chemistry by Janice Gorzynski Smith, 1st edition.

Electronic References, Websites	https://www.sciencedirect.com/topics/chemistry/heterocyclic-compound https://www.uou.ac.in/lecturenotes/science/MSCCH-17/CHEMISTRY%20LN.%203%20HETEROCYCLIC%20COMPOUN-converted%20(1).pdf

.1 Course Name
Microbiology II
.2 Course Code:
50304209
.3 Semester / Year:
2nd/ 2025
.4 Date of Course Description Preparation
2024
.5 Available Attendance Mode
Attendance
.6 Total Hours / Total Units:
3 Theory + 2 Lab
.7 Course Coordinator Name:
hidersabah@gmail.com dr. haider sabah Labouelez@horus.edu.eg dr.lamiaa abdulazeez abeeressa@gmail.com drabeer essa. safa.ali2306@sc.uobaghdad.edu.iq dr. safa nameer asmasabah695@gmail.com dr.asmaa sabah
.8 Course Objectives
This course provides the student with knowledge of the pathogenesis, morphology, laboratory diagnosis, identification, pathology, and clinical features of medically important parasitic and viral diseases and the basic concepts of immunizing procedure against these diseases.
.9 Teaching and Learning Strategies
At the end of the course the student should be able to understand how viruses and parasites causes many diseases for hum being and how can be control these diseases and eradicated by using differ types of medications and explain each diseases according to sign and symptoms and rout of transmission and control all food and drink from contaminated by these pathogens

.10 Course Structure

Course Description

Week	Topic	Key Learning Outcomes	Hours
1	Introduction, classification Helminthes: Nematods: Ascaris, Entrobius. Hookworms	Recognize and classify protozoan and helminthic parasites affecting human health.	3
2	Virology: Introduction, Comparison between viruses and bacteria and other microbes; Classification of viruses; Replication; Chemotherapy	Differentiate viruses based on their genetic material, replication strategies, and host range. Assess antiviral therapies, vaccine development strategies.	3
3	Tissue flukes, Blood flukes (Schistosoma spp). Cestods: Taenia spp., Echinococcus (Hydatid cyst).	Describe the life cycles of flukes and their implications for transmission and disease progression. Explain how flukes cause disease, including their mechanisms of immune evasion and tissue damage. Apply laboratory techniques for detecting parasitic infections. Evaluate therapeutic options, drug resistance concerns, and preventive measures.	3
4	*Herpes viridae*; Orthomyxo viruses	Understand viral architecture and how viruses replicate within host cells. Explain how viruses cause diseases, including immune evasion, host cell damage, and latency. Apply various virology diagnostic techniques such as PCR, serology, and viral culture. Assess antiviral therapies, vaccine development strategies.	3
5	Intestinal protozoa (Amoeba, Balantidium) Flagellates (Giardia, Trichomonas)	Describe the life cycles of protozoa and their implications for transmission and disease progression. Explain how protozoa cause disease, including their	3

Week	Topic	Key Learning Outcomes	Hours
		mechanisms of immune evasion and tissue damage. Apply laboratory techniques for detecting parasitic infections. Evaluate therapeutic options, drug resistance concerns, and preventive measures.	
6	Hepatitis viruses Paramyxo viruses	Understand viral architecture and how viruses replicate within host cells. Explain how viruses cause diseases, including immune evasion, host cell damage, and latency. Apply various virology diagnostic techniques such as PCR, serology, and viral culture. Assess antiviral therapies, vaccine development strategies.	3
7	Haemoflagellates: Leishmania spp.; Trypanosome spp.	Describe the life cycles of heamoflagellates and their implications for transmission and disease progression. Explain how heamoflagellates cause disease, including their mechanisms of immune evasion and tissue damage. Apply laboratory techniques for detecting heamoflagellates infections. Evaluate therapeutic options, drug resistance concerns, and preventive measures.	3
8	Corona virus, Retro viruses; Oncogenic viruses.	Understand viral architecture and how viruses replicate within host cells. Explain how viruses cause diseases, including immune evasion, host cell damage, and latency. Apply various virology diagnostic techniques such as PCR, serology, and viral culture. Assess antiviral therapies, vaccine development strategies.	3

Week	Topic	Key Learning Outcomes	Hours
9	Sporozoa: Malarial parasites of human; Toxoplasma.	Describe the life cycles of Sporozoa and their implications for transmission and disease progression. Explain how Sporozoa cause disease, including their mechanisms of immune evasion and tissue damage. Apply laboratory techniques for detecting Sporozoa infections. Evaluate therapeutic options, drug resistance concerns, and preventive measures.	3
10	Immunology and defense mechanisms	Understand the Immune System Components – Identify and describe the cells, tissues, and organs involved in innate and adaptive immunity.	3
11	Organs of the Immune system	Understand the Immune System Components – Identify and describe the cells, tissues, and organs involved in innate and adaptive immunity.	
12	Innate and Adaptive immunity immune response	Explain Immune Mechanisms – Analyze how immune responses are initiated, regulated, and resolved in health and disease.	
13	Humeral and Cellular Immunity	Explain Immune Mechanisms – Analyze how immune responses are initiated, regulated, and resolved in health and disease.	
14	Immunoglobulins and Ag and Ab reactions	Describ types of immunoglobulins and their structures and reactions with different Ags	
15	Immune system diseases	Describe Immunological Disorders – Recognize and differentiate between immunodeficiencies, hypersensitivities, autoimmunity, and other immune-related diseases.	

12. Teaching and Learning Resources

Required Textbooks

Paniker's Textbook of MEDICAL PARASITOLOGY 8th Ed

Medical Microbiology, by E .Jawetz, J.L. Melnick, E.A. Adel; Last Edition.

Main References

Paniker's Textbook of MEDICAL PARASITOLOGY 8th Ed

Medical Microbiology, by E .Jawetz, J.L. Melnick, E.A. Adel; Last Edition.

Recommended Readings

1. Course Name
Physiology
2. Course Code:
5031201 Physiology I 50301206 Physiology II
3. Semester / Year:
First and second semesters/ stage 2
4. Date of Course Description Preparation
01-02-2025
5. Available Attendance Mode
In person Aattendance
6. Total Hours / Total Units:
First semester: 45 hour (2 credits each) + 30 hours (1credit each) Second semester: 45 hour (2 credits each) + 30 hours (1credit each)
7. Course Coordinator Name:
M.Sc. Lecturer Haider Majeed Mohammed (theoretical curriculum teacher) Haider.majeed@uruk.edu.iq Teaching staff in the practical curriculum: M.Sc. Asmaa Sabah, Asmaasabah695@uruk.edu.iq M.Sc. Ruaa Mohammed Ruaa.mohammed@uruk.edu.iq Pharmacist Mina Sattam
8. Course Objectives
• Understand the basic functions of organs and systems (digestive, endocrine, and hematologic systems) • Apply theoretical knowledge in practical and laboratory contexts. • Analyze pathophysiological disorders associated with these systems. • Develop laboratory and research skills necessary for the pharmacy profession. • Empower students to acquire dialogue and discussion skills. • Empower students to acquire self-learning skills.
9. Teaching and Learning Strategies
• Explain theoretical and scientific bases using the blackboard. • PowerPoint presentation slides • Use educational videos. • Seminars. • Illustration aids such as pictures and charts.

10. Course Structure

Course Description

10-1: Course description physiology I

Week	Topic	Key Learning Outcomes	Hours
1	• Basic buildings in medical physiology • Introduction to physiology: The body as organized solutions; water, electrolytes, & acid/base; pH and buffering; acid–base disorders; diffusion; osmosis; plasma osmolality and disease; osmolal concentration of plasma and tonicity; nonionic diffusion; genesis of the membrane potential. • Energy production and transfer, biologic oxidations.	Learning the physiologic factors and terminology regarding internal and external cell environment	3
2	• Molecular building blocks nucleosides, nucleotides and nucleic acids; DNA; Replication: mitosis and meiosis; RNA. • Amino acids and proteins; protein synthesis. • Carbohydrates; citric acid cycle; factors determining the plasma glucose level. • Fatty acids and lipids; fatty acid oxidation and synthesis; ketone bodies; cellular lipids; transport of lipids in blood; free fatty acid metabolism; cholesterol metabolism; essential fatty acids; eicosanoids.	Learn the importance of carbohydrates, proteins, fats, vitamins, and others for cells.	3
3	• Molecular basis in medical physiology: • Cellular physiology in medical physiology: Cell membrane; mitochondria; lysosomes; peroxisomes; microtubules; centrosomes; cilia. • Intercellular connections; nucleus and related structures; endoplasmic reticulum; ribosomes; apoptosis; molecular medicine; transport across cell membranes; membrane permeability & membrane transport proteins; Na; K ATPase. •	Learn the functions of cell organelles and basic biocomponents in the human body.	3
4	• Channelopathies; intercellular communication; receptors for chemical messengers; mechanisms by which chemical messengers act; kinases in cancer: chronic myeloid leukemia; intracellular • Ca2+ as a second messenger; G proteins; inositol trisphosphate (IP3) and diacylglycerol (DAG) as	Learn the functions of cell organelles and basic biocomponents in the human body.	3

Week	Topic	Key Learning Outcomes	Hours
	second messengers; the adenylyl cyclase and cAMP system; guanylyl cyclase and cGMP system; growth factors; homeostasis.		
5	• Excitable Tissues • Nerves: Introduction; cellular elements in the CNS; neurons; axonal transport; action potential; excitation and conduction; resting membrane potential; ionic fluxes during action potential; nerve conduction; properties of mixed nerves.	Study of neurons and understanding the mechanisms of nerve cell excitation and impulse transmission	3
6	• Synaptic and junctional transmission: synapses; function of synaptic elements; electrical events in postsynaptic neurons (excitatory and inhibitory postsynaptic potentials).	Understanding the neuronal communications – facilitation of stimulation	3
7	• Inhibition and facilitation at synapses (postsynaptic inhibition, presynaptic inhibition, presynaptic facilitation); neuromuscular transmission (neuromuscular junction); nerve endings in smooth and cardiac muscles; denervation supersensitivity.	Understanding the neuronal communications – facilitation of inhibition	3
8	• Autonomic Nervous System (ANS) • Anatomical aspects of ANS; differences between somatic and autonomic innervation; parasympathetic and sympathetic nervous systems; physiological antagonists; neurotrans-mitters at ANS divisions; cholinergic transmission; adrenergic transmission; receptors characteristics (cholinoceptors, adrenoceptors, dopamine receptors); effects of activating autonomic nerves; integration of autonomic function (local integration and systemic reflexes); complex organ control: the eye.	Understanding the anatomy and functions and controls of autonomic nerves	3
9	• Excitable Tissue • Muscle: Introduction; types of muscles. • Skeletal muscle: skeletal muscle characteristics; sarcotubular system; electrical phenomena and ionic fluxes; contractile response; the muscle twitch; molecular basis of contraction. • Role of Ca2+ ions in muscle contraction; types of muscle contraction; summation of muscle contraction; relation between muscle length, tension and velocity of contraction; fiber types; phosphoryl-creatinine; carbohydrate and lipid	Understanding the microanatomy of skeletal muscles and the bases of their contraction and relaxation	3

Week	Topic	Key Learning Outcomes	Hours
	breakdown; the oxygen debt mechanism; heat production in muscle; properties of skeletal muscle in intact organism (the motor unit); electromyography		
10	• Smooth muscles • Smooth muscle characteristics; multi-unit smooth muscles; unitary smooth muscles; smooth muscle contraction and its control; muscle contraction; muscle relaxation; membrane activation; inputs influencing smooth muscle contractile activity.	Understanding the microanatomy of smooth muscles and the bases of their contraction and relaxation	3
11	• Cardiac Muscles • Cardiac muscle characteristics; excitation-contraction coupling in cardiac muscle (contraction and relaxation); heart anatomy (contractile and conductive tissues); heart innervation (sympathetic and parasympathetic innervation); blood supply; heartbeat coordination; sequence of excitation.	Understanding the microanatomy of cardiac cells, the coordination of contraction in the heart chambers, the control of heart rate by autonomic inputs	3
12	• Cardiovascular physiology: Electrical activity in the heart • Generation of cardiac excitation; spread of cardiac excitation; the electrocardiogram (ECG); cardiac rate. • Abnormal pacemakers; ectopic foci of excitation; reentry; atrial arrhythmias; consequence of atrial arrhythmias. • Ventricular arrhythmias; effect of changes in ionic composition of the blood; the heart as a pump; echocardiography; cardiac output; factors controlling cardiac output; cardiac contractility.	Understanding electrical changes, and contractile response of the heart and the electrical abnormalities in cardiac rhythm	3
13	• Respiratory Physiology • Respiratory organs; protective structures; mechanism of pulmonary ventilation; surfactant and its effect on surface tension. • Lung volumes and capacities; minute respiration volume. • Gas exchange; factors affecting the rate of gas diffusion through the respiratory membrane. • Transport of O2 and CO2 in blood and tissue; carrying of O2 in blood; oxyhemoglobin dissociation curve; transfer of CO2.	Learn about breathing processes and the functions of the respiratory system.	3

Week	Topic	Key Learning Outcomes	Hours
14	• Renal Physiology • Functional anatomy; function of glomerular membrane; blood vessels; the kidney capsule; Innervation of the blood vessels; Renal blood flow. • Renal venous pressure; Regulation of renal blood flow; auto-regulation of renal blood flow. Glomerular Filtration Rate (GFR);	Learning the microanatomy of kidney and nephrons and regulation of renal blood flow	3
15	• Control of GFR; mechanism of tubular reabsorption and secretion; Na+ reabsorption. • Glucose reabsorption; osmotic diuresis; water diuresis; regulation of Na+ excretion; adrenocortical steroids; other humoral factors; water intoxication; regulation of K+ excretion; diuretics.	Learning the mechanism and control of renal filtration of blood and tubular reabsorption	3

10-2: Course description physiology II

Week	Topic	Key Learning Outcomes	Hours
1	• Digestive system • Gastrointestinal function: function of stomach, small intestine, pancreas, liver, purpose of GI motility, large intestine, water absorption. • Digestion and absorption of carbohydrates, proteins, fats, absorption of vitamins and minerals.	Understand the structure and function of the digestive system. Explain the roles of the stomach, small intestine, pancreas, and liver. Describe digestion and absorption of carbohydrates, proteins, fats, vitamins, and minerals.	3
2	• Regulation of GIT basic principles: neural regulation, hormonal regulation, Phases of Gastrointestinal Control. • Fatty acids and lipids; fatty acid oxidation and synthesis; ketone bodies; cellular lipids; transport of lipids in blood; free fatty acid metabolism; cholesterol metabolism; essential fatty acids; eicosanoids.	Explain neural and hormonal regulation of GI function. Describe lipid metabolism (oxidation, synthesis, ketone bodies, cholesterol, and eicosanoids).	3
3	• Specific contractile and secretory processes that occur in each segment of the GIT: Mouth, Pharynx, and Esophagus (Chewing, salivation, swallowing) • The stomach: anatomy, HCl Production and secretion, pepsin secretion, stimulation of pepsin, function of pepsin.	Describe chewing, salivation, and swallowing. Explain HCl and pepsin secretion and their roles in digestion.	3

Week	Topic	Key Learning Outcomes	Hours
	•		
4	• Gastric Motility: frequency and force of contraction. • Pancreatic Secretions: bicarbonate, enzymes, control of secretions. • Bile secretion, bile function. • Small intestine: anatomy, function, secretion, absorption, and motility. • Large intestine: anatomy, function, secretion and motility. • Pathophysiology of the GIT: Ulcers, vomiting, dehydrations, gallstones, constipation and diarrhea.	Explain gastric motility patterns. Describe pancreatic enzyme and bicarbonate secretion. Summarize bile production and function. Compare small vs. large intestine functions. Discuss ulcers, gallstones, diarrhea, and constipation.	3
5	• Endocrine and reproductive physiology • General function or role of endocrine system, hormones (definition and classification), hormone secretion, hormone transport and clearance from the blood. • Mechanisms of Action of Hormones: Hormone Receptors and Their Activation •	Define hormone types and their secretion/transport. Explain hormone-receptor interactions and signaling.	3
6	• Growth “somatotropic or somatotropin” hormone: physiological functions of GH, regulation of GH secretion. • Thyroid metabolic hormones: Anatomy of thyroid gland, function of thyroid gland, synthesis and secretion of the thyroid metabolic hormones, Physiologic micro-anatomy of the thyroid gland, synthesis of metabolic thyroid hormones, transport of thyroxin and T3 to tissues.	Describe GH functions and regulation. Explain thyroid hormone synthesis, transport, and actions.	3
7	• . Hypothalamic regulation of hormonal functions: Hypothalamus maintains body homeostasis, anatomy of the hypothalamus, relation to the pituitary gland “hypophysis”, signals to the hypothalamus (thirst). • Control of Posterior Pituitary Secretion (Vasopressin & Oxytocin), functions of vasopressin and oxytocin, Control of anterior pituitary hormones secretion. Cell types in the anterior pituitary.	Explain hypothalamus-pituitary axis control. Describe vasopressin, oxytocin, and anterior pituitary hormones.	3

Week	Topic	Key Learning Outcomes	Hours
8	• Physiological Functions of the Thyroid Hormones: genomic and non-genomic effects, Regulation of TH Secretion, Diseases of the Thyroid. • Adrenocortical Hormones: Hormones of adrenal cortex (Mineralocorticoids and Glucocorticoids). • Functions and regulation of the Mineralocorticoids and Aldosterone hormones •	Discuss genomic/non-genomic thyroid hormone effects. Compare glucocorticoid and mineralocorticoid functions.	3
9	• Pancreatic Hormone Physiology: Anatomy of pancreas, Hormones of the pancreas. • Insulin: synthesis of insulin, metabolism and secretion, action of insulin. • Glucose: Glucose transporters, diabetes mellitus (DM). • Glucagon: Stimulants of secretion, inhibitors of secretion, Action of glucagon. • Somatostatin (SIH) • Somatotropin “STH” (growth hormone “GH”) • Male reproductive system • Female reproductive system	Explain insulin, glucagon, and somatostatin roles. Outline male/female reproductive system functions.	3
10	• Blood physiology • Function and composition, plasma, hemopoiesis, bone marrow, regulation of hemopoiesis. • Red blood cells: Erythropoiesis, regulation of erythropoiesis. • Hemoglobin (function, synthesis, destruction), anemia, red cell indices (MCV, MCHC, MCH), polycythemia. •	Describe blood composition and hematopoiesis. Explain erythropoiesis, hemoglobin function, and anemia.	3
11	• White blood cells: Leukopoiesis, granulocytes & monocytes, diapedesis, phagocytosis, inflammation, immune mechanism & role of lymphocytes. • Blood types (blood groups): genetic determination of agglutinogens, blood tying, the Rh system, transfusion reactions. • Platelets: origin, structure & function, hemostasis and blood coagulation, clotting mechanisms, clot retraction, hemostatic control mechanism.	Summarize leukocyte functions and phagocytosis. Explain blood groups, clotting, and hemostasis.	3

Week	Topic	Key Learning Outcomes	Hours
12	• Blood disorders: Anemia, sickle cell disease, hemophilia, leukemia. Stem cell transplant. • Immunity • Innate immunity - first line (skin, nose, saliva, stomach, urine) - second line of defense (antimicrobial substances, natural killer cells and phagocytosis, microbial evasion of phagocytosis, phases of phagocytosis, inflammation, Abscess and ulcers. •	Discuss anemia, hemophilia, and leukemia. Describe skin, phagocytosis, and inflammation as defenses.	3
13	• Adaptive immunity: maturation of T-lymphocytes and B-lymphocytes, cell mediated immunity and humoral immunity, clonal selection, antigen and antigen receptors, diversity of antigen receptors, major histocompatibility complex antigen, pathways of antigen processing.	Compare T-cell and B-cell maturation. Explain antigen processing and MHC roles.	3
14	• Activation of T-lymphocytes, activation and clonal selection of T-helper cells, activation and clonal selection of cytotoxic T-cells, elimination of invaders, immunological surveillance.	Describe clonal selection of T-helper and cytotoxic T-cells. Summarize immune surveillance.	3
15	• Antibody mediated (humoral) immunity: Activation and clonal selection of B-cells, antibodies (structure and action), role of complement system in immunity, immunological memory, self-recognition and self-tolerance.	Explain B-cell activation and antibody functions. Discuss immune memory and self-tolerance.	3

11. Course evaluation

The grade is distributed out of 100, with 60 marks for the final exam and 40 marks for the semester effort (20 marks for the practical aspect and 20 marks for the theoretical aspect). The student obtains it according to the tasks assigned to him, such as daily preparation, paper exams (weekly and mid-semester), oral exams, report writing, and technical work in the laboratory.

12. Teaching and Learning Resources

12-1. Required Textbooks

Review of Medical Physiology; Ganong W.F (Ed.), Latest edition.

12-2. Main References

Textbook of Medical Physiology by Guyton AC; latest edition.

12-3. Recommended Readings

- Vander Human Physiology: The Mechanisms of body function. Latest edition.
- Researchgate.com
- Googlescholar.com
- PubMed
- Medscape
- YouTube

Course description model

1. Course title
Pharmacognosy and medicinal plants 1
2. Course code
50306211
3. Semester/year
2nd semester/level 2
4. Date
1/2/2025
5. Available attendance forms
In person
6. Number of study hours (total) / Number of units (total)
3 theoretical hrs/week (4 groups) total 12 hrs/week **2 practical hrs/week (8 groups) total 16 hrs/week**
7. Name of the course administrator (if more than one name is mentioned)
Theoretical lecture teaching **Ass. Prof. Dr. Rasha Adel Abdel-monem Attia** rashaadelelfeqy@gmail.com **Practical lab teaching and supervision** • **Ass. Prof. Dr. Rasha Adel Abdel-monem Attia** • **Ass. lecturer Zahraa Sadi** • • **Ass. lecturer Raheeq Khairy**
8. Course objectives

• **The student will be able to understand the benefits of medicinal plants to humans and the scientific foundations for their study, production, and therapeutic use.** • **Learn about the chemical classification of medicinal plant components and the techniques for separating and identifying these components using various chromatographic methods.**	

• **Learn the basics of quality control for natural products in their raw form and after their processing into pharmaceuticals.**	
9. Teaching and learning strategies	
• **Lectures** • **Practical laboratory experiments** • **Interactive oral discussions** • **Research and presentations** • **Group work and report writing of experimental results**	**Strategies**
10. Course structure **A. Pharmacognosy 1/ theoretical course/ level 2/2nd semester**	

طريقة التقييم	طريقة التعليم	الموضوع	مخرجات التعلم	الساعات	الاسبوع
Theoretical Exam Oral Discussions	Theoretical lecture	General Introduction: The Scope of Pharmacognosy, definitions and basic principles.	knowledge	3	1
midterm and final Exam Oral Discussions	Theoretical lecture	Drugs from natural sources, crud drugs, official and non-official drugs. Classification of natural products.	knowledge skills	3	2
midterm and final Exam Oral discussions	Theoretical lecture	Classification of natural products.	knowledge skills	3	3
midterm and final Exam Oral discussions	Theoretical lecture	Plant nomenclature and taxonomy.	knowledge	3	4
midterm and final Exam Oral discussions	Theoretical lecture	Production of crude drugs: Cultivation, collection, preparation, drying and storage.	knowledge	3	5
midterm and final Exam Oral discussions	Theoretical lecture	Adulteration and deterioration of crude natural products	knowledge skills	3	6
midterm and final Exam Oral discussions	Theoretical lecture	Pharmacological efficacy of natural products	knowledge skills	3	7
midterm and final Exam	Theoretical lecture	Chemistry of natural drug products.	knowledge skills	3	8

Oral discussions					
midterm and final Exam Oral discussions	Theoretical lecture	Quality control: Evaluation of natural products; macroscopical evaluation; physical evaluation; chemical evaluation; biological evaluation; spectroscopical evaluation.	knowledge	3	9
midterm and final Exam Oral discussions	Theoretical lecture	Separation technique: Introduction; Mechanisms of separation and classification based on the type of technique	knowledge	3	10
midterm and final Exam Oral discussions	Theoretical lecture	Column, paper chromatography; Thin layer chromatography	knowledge	3	11
midterm and final Exam Oral discussions	Theoretical lecture	Ion-exchange chromatography; Gel filtration chromatography; electrophoresis	knowledge	3	12
midterm and final Exam Oral discussions	Theoretical lecture	HPLC	knowledge	3	13
midterm and final Exam Oral discussions	Theoretical lecture	Gas chromatography	knowledge	3	14
midterm and final Exam Oral discussions	Theoretical lecture	Tissue culture of medicinal plant: Introduction and history; laboratory of the plant tissue culture; aseptic techniques Application of the plant tissue culture; environmental and biological control; plant growth regulators.	knowledge	3	15

ب. عقاقير 1/ المادة العملية/الصف الثاني/ الفصل الدراسي الثاني

طريقة التقييم	طريقة التعليم	الموضوع	مخرجات التعلم	الساعات	الاسبوع
Report Evaluation Oral Discussions Written Exam Seminar and Presentations	Practical lab work team work report writing Data show	Micro measurement and magnification	Practical and professional skills	2	**1**
Report Evaluation Oral Discussions Written Exam	Practical lab work team work report writing Data show	Microscopical identification of crude drugs and cell contents	Practical and professional skills	2	**2**

Seminar and Presentations					
Report Evaluation Oral Discussions Written Exam Seminar and Presentations	Practical lab work team work report writing Data show	Extraction and separation techniques (Soxhlet and Clevenger)	Practical and professional skills	2	**3**
Report Evaluation Oral Discussions Written Exam Seminar and Presentations	Practical lab work team work report writing Data show	Chromatography introduction, column chromatography	Practical and professional skills	2	**4**
Report Evaluation Oral Discussions Written Exam Seminar and Presentations	Practical lab work team work report writing Data show	Paper chromatography (circular and horizontal paper chromatography)	Practical and professional skills	2	**5**
Report Evaluation Oral Discussions Written Exam Seminar and Presentations	Practical lab work team work report writing Data show	Introduction to thin-layer chromatography	Practical and professional skills	2	**6**
Report Evaluation Oral Discussions Written Exam Seminar and Presentations	Practical lab work team work report writing Data show	TLC on microscope slides and precoated	Practical and professional skills	2	**7**
Report Evaluation Oral Discussions Written Exam Seminar and Presentations	Practical lab work team work report writing Data show	Partition chromatography for the separation of volatile oils	Practical and professional skills	2	**8**
Report Evaluation Oral Discussions Written Exam Seminar and Presentations	Practical lab work team work report writing Data show	Effect of activity adsorbent on Rf values	Practical and professional skills	2	**9**
11. course assessments					
Practical 20 marks					

Theoretical 20 marks Final written exam 60 marks	
12. Education and teaching resources	
1. Trease and Evans Pharmacognosy, Latest edition. 2. Practical guide of Pharmacognosy 1/ 2nd level/ 2nd semester	**Required textbooks**
Michael Heinrich, Joanne Barnes; Fundamentals of pharmacognosy and phytotherapy 2017	**Main References (Sources)**
Biren S. (Textbook of Pharmacognosy & Phytochemistry), Elsevier, India, 2013. Fundamentals of Pharmacology and Phytotherapy	**Recommended books and references (magazines, reports, etc.)**
- A. Fahan, Plant Anatomy, Pergamon Press. 2002. - http://www.scribd.com/doc/75980088/Atlas-of-Medicinal-Plants-II - http://pharmacystudent-prep.blogspot.com - http://www.pharma-board.com/board/fopgal/index.php **Google search for plants**	**Electronic sources and websites**

Course Description Form

1. Course Name:

Arabic

2. Course Code:

50301106

3. Semester / Year:

Semester: 1st Year / 1st Semester

4. Description Preparation Date:

February 2025

5. Available Attendance Forms:

In-Person

6. Number of Credit Hours (Total) / Number of Units (Total)

2 (2 Theoretical)

7. Course administrator's name (mention all, if more than one name)

saad.almula.51@gmail.com سعد محسن.م.م

8. Course Objectives

- **• To introduce students to the essence and values of Islamic culture.**
- **• To highlight the Islamic perspective on science and knowledge.**
- **• To present the characteristics of Islamic civilization and its contributions to hur progress.**
- **• To foster awareness of Islamic ethical standards and professional values.**

9. Teaching and Learning Strategies

- Lectures and presentations
- Discussion and debate
- Case-based learning
- Written assignments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction Islamic culture	Introduction Islamic culture	Lecture Discussion	Participation

2	2	The Isla worldview principles	The Isla worldview principles	Lecture Examples	Quiz
3	2	Knowledge and significance Islam	Knowledge and significance Islam	Lecture Analysis	Written assignment
4	2	Islamic civiliza and its scien contributions	Islamic civiliza and its scien contributions	Lecture + C Study	Class activity
5	2	Midterm Exam	Midterm Exam	—	Written Exam
6	2	Ethics in Islam personal conduc	Ethics in Islam personal conduc	Lecture Discussion	Short essay
7	2	Islamic law societal values	Islamic law societal values	Lecture Dialogue	Oral question
8	2	Contemporary issues in Isla culture	Contemporary issues in Isla culture	Lecture Debate	Final report
9	2	Revision conclusion	Revision conclusion	Interactive session	Final evaluati

11. Course Evaluation

- Midterm Exam: 20%
- Quizzes and Assignments: 20%
- Final Exam: 60%

Total: 100%

12. Learning and Teaching Resources

Required textbo (curricular books, if a	• Main Reference: Islamic Culture by Dr. Abdul Karim Zidan. • Supplementary: Islamic Civilization and Ethics Textbooks.

Course Description

1. Course Name:
Physical Pharmacy I
2. Course Code:
50303203
3. Semester / Year:
First Semester / 2nd Stage
4. Description Preparation Date:
2025/2/5
5. Available Attendance Forms:
In-person3
6. Number of Credit Hours (Total) / Number of Units (Total)
(3 theoretical, 2 practical)
7. Course administrator's name (mention all, if more than one name)
Name: prof. Dr. Khalid Al-Ani Asst. Lecturer Sajad Moneam Asst. Lecturer Noor Al-Huda Haidar Email: khalidalani44@yahoo.com sajadmoneam2@gmail.com nooralhuda@gmail.com
8. Course Objectives
• **To understand and apply quantitative and theoretical principles related to various physical states of matter, and to explore their applications in pharmaceutical sciences. This knowledge helps pharmacists understand drug solubility, compatibility, and biological activity—enabling them to contribute to the development of new drug formulations and effective drug delivery systems.**
9. Teaching and Learning Strategies

Strategy	Quizzes Oral discussions Midterm and final exams Practical report evaluation

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation	meth
1	3	1. States of matt gases, liqui solids	1. States matter: gases, liquids, solids	Lectures a experiments	Dis an	cuss l exa
2	3	2. States matter: phase equilibria	2. States matter: phase equilibria	Lectures a experiments	Dis an	cuss l exa
3	3	3. States matter: thermal analysis	3. States matter: thermal analysis	Lectures a experiments	Dis an	cuss l exa
4	3	4. Thermodynamics: basic principles and thermal chemistry	4. Thermodynamics: basic principles and thermal chemistry	Lectures a experiments	Dis an	cuss l exa
5	3	5. Thermodynamics: second and third laws	5. Thermodynamics: second and third laws	Lectures a experiments	Dis an	cuss l exa
6	3	6. Non-electrolyte solutions and properties	6. Non-electrolyte solutions and properties	Lectures a experiments	Dis an	cuss l exa
7	3	7. Non-electrolyte solutions: determination of molecular weight	7. Non-electrolyte solutions: determination of molecular weight	Lectures a experiments	Dis an	cuss l exa
8	3	8. Electrolyte solutions: Arrhenius theory of dissociation and ionic strength	8. Electrolyte solutions: Arrhenius theory of dissociation and ionic strength	Lectures a experiments	Dis an	cuss l exa
9	3	9. Electrolyte solutions: Debye–Hückel theory	9. Electrolyte solutions: Debye–Hückel theory	Lectures a experiments	Dis an	cuss l exa

10	3	10. Ionic equilibria: acid-base theories, ionic dissociation	10. Ionic equilibria: acid-base theories, ionic dissociation	Lectures a experiments	Dis cuss an exa
11	3	11. Ionic equilibria: pH and the effect of ionic strength and buffer capacity	11. Ionic equilibria: pH and the effect of ionic strength and buffer capacity	Lectures a experiments	Dis cuss an exa
12	3	12. Ionic equilibria: buffer calculations	12. Ionic equilibria: buffer calculations	Lectures a experiments	Dis cuss an exa
13	3	14. Buffer systems: Henderson-Hasselbalch equation and buffer preparation	14. Buffer systems: Henderson-Hasselbalch equation and buffer preparation	Lectures a experiments	Dis cuss an exa
14	3	15. Buffer systems: biological buffers	15. Buffer systems: biological buffers	Lectures a experiments	Dis cuss an exa
15	3	15. Buffer systems: biological buffers	15. Buffer systems: biological buffers	Lectures a experiments	Dis cuss an exa

11. Course Evaluation

Midterm Exam 15

Oral exams & reports 5

Quizzes 20

Final Exam 70

Total 100

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	*martin's Physical Pharmacy and Pharmaceutical S cience* Sinko, Lippincott Williams & W ilkins 2. Lab Manual for Physical Pharmacy – adopted by he dep

Course Description

1. Course Name:
Physical Pharmacy II
2. Course Code:
50303208
3. Semester / Year:
2nd Semester / 2nd Stage
4. Description Preparation Date:
2025/2/5
5. Available Attendance Forms:
In-person3
6. Number of Credit Hours (Total) / Number of Units (Total)
(3 theoretical, 2 practical)
7. Course administrator's name (mention all, if more than one name)
Name: prof. Dr. Khalid Al-Ani Asst. Lecturer Sajad Moneam Asst. Lecturer Noor Al-Huda Haidar Email: khalidalani44@yahoo.com sajadmoneam2@gmail.com nooralhuda@gmail.com
8. Course Objectives
• **To understand and apply quantitative and theoretical principles related to various physical states of matter, and to explore their applications in pharmaceutical sciences. This knowledge helps pharmacists understand drug solubility, compatibility, and biological activity—enabling them to contribute to the development of new drug formulations and effective drug delivery systems.**
9. Teaching and Learning Strategies

Strategy	Quizzes Oral discussions Midterm and final exams Practical report evaluation

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation	meth
1	3	1. Solubility and dissolution: expression methods, interaction between solute and solvent, solubility of liquids	1. Solubility and dissolution: expression methods, interaction between solute and solvent, solubility of liquids	Lectures a experiments	Dis an	cuss exa
2	3	2. Solubility in solid materials and weak electrolyte solubility, effects on pharmaceutical dosage	2. Solubility in solid materials and weak electrolyte solubility, effects on pharmaceutical dosage	Lectures a experiments	Dis an	cuss exa
3	3	3. Solubility and dissolution in immiscible solvents, partition coefficient	3. Solubility and dissolution in immiscible solvents, partition coefficient	Lectures a experiments	Dis an	cuss exa
4	3	4. Drug stability and degradation kinetics	4. Drug stability and degradation kinetics	Lectures a experiments	Dis an	cuss exa
5	3	5. Drug stability: reaction rate and dosage	5. Drug stability: reaction rate and dosage	Lectures a experiments	Dis an	cuss exa
6	3	6. Drug stability: temperature and other factors affecting dosage	6. Drug stability: temperature and other factors affecting dosage	Lectures a experiments	Dis an	cuss exa
7	3	7. Diffusion across biological membranes, permeability changes	7. Diffusion across biological membranes, permeability changes	Lectures a experiments	Dis an	cuss exa

8	3	8. Diffusion: solubility effect on permeability	8. Diffusion: solubility effect on permeability	Lectures a experiments	Dis cuss an exa
9	3	9. Diffusion: effect of solubility and permeability variation	9. Diffusion: effect of solubility and permeability variation	Lectures a experiments	Dis cuss an exa
10	3	10. Colloidal systems: interface phenomena between liquids and surface tension	10. Colloidal systems: interface phenomena between liquids and surface tension	Lectures a experiments	Dis cuss an exa
11	3	11. Colloids: factors affecting surface tension and surfactant phenomena	11. Colloids: factors affecting surface tension and surfactant phenomena	Lectures a experiments	Dis cuss an exa
12	3	12. Colloids: interfacial tension, diffusion coefficient	12. Colloids: interfacial tension, diffusion coefficient	Lectures a experiments	Dis cuss an exa
13	3	13. Colloids: lyophilic and lyophobic systems	13. Colloids: lyophilic and lyophobic systems	Lectures a experiments	Dis cuss an exa
14	3	14. Suspensions: dispersed systems and pharmaceutical applications	14. Suspensions: dispersed systems and pharmaceutical applications	Lectures a experiments	Dis cuss an exa
15	3	15. Suspensions: types of suspensions, physical properties	15. Suspensions: types of suspensions, physical properties	Lectures a experiments	Dis cuss an exa
11. Course Evaluation					

Midterm Exam 15 Oral exams & reports 5 Quizzes 20 Final Exam 70 **Total 100**

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	*martin's Physical Pharmacy and Pharmaceutical S*ience Sinko, Lippincott Williams & Wilkins 2. Lab Manual for Physical Pharmacy – adopted by the dep

Course Description

1. Course Name:
Crimes Against the State System
2. Course Code:
50304217
3. Semester / Year:
2th year / 2nd Semester
4. Description Preparation Date:
February 2025
5. Available Attendance Forms:
In-Person
6. Number of Credit Hours (Total) / Number of Units (Total)
2/
7. Course administrator's name (mention all, if more than one name)
Name: Lecturer Saad Al-Mula Email: saad.almula.51@gmail.com
8. Course Objectives
To study the concept of political, behavioral, psychological, and social crimes, their causes and consequences, course also addresses environmental crimes and collective crimes that impact national sovereignty. •
9. Teaching and Learning Strategies

Strategy	• Lectures with interactive exercises • Role-playing and simulations • Group discussions and presentations • Feedback and self-evaluation

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Le
1	2	Crimes Against the State System and Analysis of Supreme Constitutional Court Decisions	Crimes Against the State System	
2	2	Political Crimes and Legal Interpretations of Supreme Constitutional Court Decisions	Political Crimes and Legal Interpretations	
3	2	Listening skills and barriers	Listening skills and barriers	
4	2	Types of International Crimes	Types of International Crimes	
5	2	Midterm Exam	Midterm Exam	

6	2	Rulings from Criminal Courts	Rulings from Criminal Courts
7	2	Land Alteration and Ecological Damage	Land Alteration and Ecological
8	2	Collective Mass Crimes	Collective Mass Crimes
9	2	Defining Collective Evidence Crimes in Iraqi Legislation	Defining Collective Evidence Crimes in Iraqi Legislation

11. Course Evaluation

Midterm Exam: 30%
• Final Exam: 70%
Total: 100%

12. Learning and Teaching Resources

Prescribed Textbooks (if available)	Ministry-approved curriculum (if present) – *Crimes Against the State System in Iraq*
Main References	Official Ministry Sources – *Crimes Against the State System in Iraq*
Recommended Supplementary Materials	Scientific journals, research articles, and legal commentaries
Electronic Sources	Internet websites and digital libraries as advise

نموذج وصف المقرر

- Course Name
Pharmaceutical technology I
Course Code:
5030302
Semester / Year:
First course / 3ed stage
Date of Course Description Preparation
2025/5
Available Attendance Mode
حضوري
Total Hours / Total Units
ثلاث ساعات نظري / ساعتان عملي
Course Coordinator Name:
النظري / م.د. اسماء محمد رشيد asmaamohammad@uruk.edu.iq العملي / م.م. هبة محمد سوزه heba_mohamed@uruk.edu.iq م.م. حوراء كريم خفيف hawraa.k.khafif@uruk.edu.iq
Course Objectives

اهداف المادة الدراسية	الاهداف المعرفية تعلم الاسس النظرية لتقنية تحضير الاشكال الصيدلانية المختلفة من حيث موادها الاولية و تركيباتها و طرق تحضيرها و ثباتها و تخزينها و استخداماتها . في نهاية الفصل الدراسي , من المتوقع ان يتعلم الطالب : ان يكون قادرا على التمييز بين الانواع المختلفة لانظمة التشتت , الجزيئية و الغروية و الخشنة تمكين الطالب من اعداد محاليل بسيطة ان يكون قادرا على اجراءات الحسابات اللازمة لاعداد نماذج الجرعات الصيدلانية ان يكون قادرا على التمييز بين الاشكال الصيدلانية القدرة على اختيار الطريقة و الاضافات المناسبة لتحضير الاشكال الصيدلانية القدرة على اختيار الشكل الصيدلاني المناسب للمكونات النشطة.

1. ستراتيجيات التعليم والتعلم

الاستراتيجية	محاضرات مناقشة الامتحانات اليومية التقارير

2. بنية المقرر

الاسبوع	الساعات	مخرجات التعلم المطلوبة	الوحدة/الموضوع	طريقة التعلم	طريقة التقييم
1-2	4 محاضرة 2 مختبر	Introduction to pharmaceutical Technology, Pharmaceutical solutions; definition, classification	Solutions (into body cavity, oral and external use). Solutions: preparation of oral	محاضرة نظري تعليم مختبري مناقشات جماعية	الامتحان الشفوي الامتحان التحريري اختبارات اعداد التقارير

		and external solution 1) Carminative mixture for infants 2) Carminative mixture for adults Iodine Solutions	of pharmaceutical solution method of preparation of solution Solubility, expression of solubility, water as a solvent Methods of preparation of purified water		
المناقشات اختبارات اعداد التقارير	محاضرة نظري	Solutions (into body cavity, oral and external use). Solutions: preparation of oral and external solution 1) Mist Diuretics: acidic and alkaline 2) drops: nasal, ear and eye 3) Gargles & Mouthwash 4) Mandl's throat paint 5) External solutions Solution 1 and Solution 2	Types of water Examples of solutions Injectables Oral solutions Rectal solutions Mouth wash Vaginal solutions Ophthalmic solutions Topical solutions Aromatic water Aqueous solutions containing aromatic principles; aromatic waters; methods of preparations; stability.	3 محاضرة 2 مختبر	2-3
المناقشات اختبارات اعداد التقارير	محاضرة نظري	Syrups: Preparation techniques and quality evaluation. Syrups: sugar based syrup and sugar free syrup +quiz	Syrups: Types of syrups, sugar as sweetener Components of syrups Method of preparation Calculation of preservative concentration Stability of sugar-based syrups Artificial syrups Examples of syrups	5 محاضرة و4 مختبرت	3-4
المناقشات اختبارات اعداد التقارير	محاضرة نظري	Spirits and elixir: Preparation techniques and evaluation: 1) Aromatic spirit of ammonia 2) Spirit of camphor 3) spirit of anise 4) Phenobarbital elixir 5) Pediatric paracetamol elixi	Elixirs and Spirits Preparation of solutions using mixed solvent systems; spirits, and elixirs. Specification Uses Collodions	4 محاضرات ومختبرين	5-6
المناقشات اختبارات اعداد التقارير	محاضرة نظري	Suspensions: classification Suspensions: diffusible and in diffusible solid preparation suspension: 1) Boric acid suspension 2) Bismuth	Coarse dispersion; suspensions. Definition, reason for suspension Routes of administration of suspensions, specification Coarse dispersion. Rate of sedimentation Factors affecting sedimentation Sedimentation volume,	3 محاضرة ومختبرين	6-7

		carbonate suspension 3) Phenacetin suspension 4) Aspirin suspension	degree of sedimentation Flocculation Method to control flocculation		
امتحان نصف الكورس			7-8		
المناقشات اختبارات اعداد التقارير	محاضرة نظري	Preparation of Suspensions containing precipitate forming liquid: Tincture of tolu balsam suspension 2) Suspensions containing poorly wettable solid: Calamine suspension Compound Sulphur lotion 3) Dispersions of oil in inhalation 4) Suspensions prepared by chemical reaction	Colloidal dispersions; Definition particle size range classification lyophilic; lyophobic, amphiphilic Methods of preparations Polymers and SAA Examples	4 محاضرة ومختبرين	9-10
		Final lab exam	Extracted Products Methods of extraction Extraction; maceration and percolation. Types of extracted products Tinctures; fluid extracts; extracts of resins and oleoresins Specification	5 محاضرة ومختبرين	11-12
			Final exam		13-15

تقييم المقرر
امتحان نصف الكورس و امتحان قصير 20 درجة المختبر العملي 20 درجة الامتحان النهائي 60 درجة
مصادر التعلم و التدريس

الكتاب المنهجي المطلوب	Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems Eleventh Edition
المراجع الرئيسية (المصادر)	Aulton's Pharmaceutics: The Design and Manufacture of Medicines, 3ed Michael E. Aulton (Author). Churchill, Livingstone-Elsevier British Pharmacopeia BP United stated Pharmacopeia USP
الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية , التقارير)	Physiochemical Principles of Pharmacy Alexender T Florence, David Attwood 4th Edition Chapter 10 (2006) 5th Edition Chapter 11(2011)
مصادر مكتبية	مصادر الكترونية

.1 Course Name
Inorganic Pharmaceutical Chemistry
.2 Course Code:
103013313
.3 Semester / Year:
First semester 2024-2025
.4 Date of Course Description Preparation
September 2024
.5 Available Attendance Mode
On campus
.6 Total Hours / Total Units:
30 / 3
.7 Course Coordinator Name:
Lec.Dr. Mustafa Maher Allawi mostafa_maher@uruk.edu.iq **laboratory** **Assist.Lec.** Tariq Talal **tariq_sonic@yahoo.com** **Assist.Lec.** Tabarak Mohammed tabarkchemist@gmail.com **Assist.Lec.** Fatima Salam
.8Course Objectives
1-Shedding light on the biological role of elements, ions, and inorganic compounds. 2- Studying the biological and pathological effects of essential elements for the body, as well as investigating the toxic and therapeutic effects of non-essential elements. 3-Investigating the atomic structure of radioactive isotopes, along with their biological, therapeutic, and medical effects, and the different types of atomic radiation. 4-Exploring the biological and therapeutic impact of inorganic compounds in treating gastrointestinal diseases and their various pharmaceutical applications.
.9 Teaching and Learning Strategies

1-Theoretical Lectures 2-Conducting Scientific Experiments 3-Study Circles/Seminars 4-Daily Assignments 5-Written Examinations 6-Methodological and Supplementary Books 7-Illustrative Videos informative videos.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	6	Understand how molecular and structural formulas represent chemical compounds. Comprehend the concept of chemical complexes and their importance in inorganic chemistry.	Molecular and Structural Formulas / Complexes	Lectures	Oral and Written Exam
2-5	5	Differentiate between essential and non-essential elements in biological systems. Recognize the significance of elements present in low concentrations for biological functions.	Essential and Non-Essential Elements with Low Concentrations	Lectures	Oral and Written Exam
6-7	4	identify key inorganic compounds utilized in the treatment of gastrointestinal disorders. Understand the mechanisms of action and potential side effects associated with these compounds.	Inorganic Compounds Used in Treating Gastrointestinal Disorders	Lectures	Oral and Written Exam
8	2	Explore the inorganic compounds commonly employed in topical treatments. Evaluate the effectiveness and safety considerations of these compounds in dermatological applications.	Inorganic Compounds Used in Topical Treatment	Lectures	Oral and Written Exam
9	1	Familiarize with inorganic compounds utilized in dental treatments and restorative materials. Understand their roles in preventing and treating dental conditions.	Inorganic Compounds Used in Dental Treatment	Lectures	Oral and Written Exam
10-12	6	Define radiopharmaceuticals and their application in nuclear medicine.	Radiopharmaceuticals	Lectures	Oral and Written Exam

		Learn about the production, labeling, and clinical use of radiopharmaceuticals.			
13-15	6	Explore specific inorganic compounds employed in the formulation of radiopharmaceuticals. Understand their properties, stability, and relevance in diagnostic and therapeutic procedures.	Inorganic Compounds Used in Radiopharmaceuticals	Lectures	Oral and Written 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

20 marks for practical work in the lab and quizzes

20 marks for mid-term exam and quizzes and oral discussions

60 marks for final term exam

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Required Textbooks: Inorganic Medicinal and Pharmaceutical Chemistry by Block, Roche Soine and Wilson, latest edition Wilson and Gisvold; Textbook of Organic medicinal and pharmaceutical chemistry; Delgado JN, Remers WA, (eds); latest edition
Main references (sources)	Primary References (Sources): Inorganic Medicinal and Pharmaceutical Chemistry by Block, Roche Soine and Wilson, latest edition Wilson and Gisvold; Textbook of Organic medicinal and pharmaceutical chemistry; Delgado JN, Remers WA, (eds); latest edition
Recommended books and references (scientific journals, reports...)	Recommended Books and References (Scientific Journals, Reports, etc.):
Electronic References, Websites	Electronic References, Websites, etc.:

.1 Course Name
Pharmacognosy II
.2 Course Code:
50306305
.3 Semester / Year:
1st Semester/2024-2025
.4 Date of Course Description Preparation
9/2024
.5 Available Attendance Mode
Official attendance time
.6 Total Hours / Total Units:
Theory 2 hours (10 hrs. a week for 5 groups) Laboratory 2 hours (20 hrs. a week for 10 sub-groups)
.7 Course Coordinator Name:
• **Theoretical presenter:** Assist. Lec. Nour Rasim Esmail **dr.noor_rasim@uruk.edu.iq** • **Lab. Presenters:** 1. Assist. Lec. Zahraa Saadi Abdullah **Zahriasaadi92@gmail.com** 2. Raheeq khairy **raheeqrory97@gmail.com**
.8Course Objectives
Introducing students to the importance of medicinal plants, their scientific names, and how to extract the active ingredients found in the most important medicinal plants, also the methods used for isolating, purifying, and detecting them in order to prepare them in the laboratory and make chemical changes to increase their effectiveness and reduce their side effects.
.9 Teaching and Learning Strategies

Presentations
Interactive Discussions
Brainstorming
Research and Induction
Small Groups
Discussion Panels
Volunteer Work

.10 Course Structure

Course Description

Week	Topic	Key Learning Outcomes	Hours
1	Introduction: General biosynthetic pathway of secondary metabolites	Phytochemistry is the study of phytochemicals, which are chemicals derived from natural sources (plants, animals, and microorganisms). Phytochemists seek to describe the structures of a large number of secondary metabolites, the functions of these compounds in humans, and their biosynthesis. Phytochemistry can be considered a subfield of botany or chemistry. Activities may be conducted in botanical gardens or in the wild with the help of ethnobotany. Phytochemical studies directed toward human use (i.e., drug discovery) may fall within the discipline of pharmacology, while phytochemical studies focusing on the ecological functions and evolution of phytochemicals are	2
2	Follow biosynthesis and carbohydrates.		2
3	Glycosides: Biosynthesis, physical and chemical properties; cardiacglycosides; saponin glycosides; anthraquinone glycosides; flavonoidglycosides; cyanophore lycosides.		5
4	Glycosides: Isothiocyanate glycosides; aldehyde glycosides; alcoholicglycosides; phenolic glycosides; lactone glycosides; coumarins and chromones.		5
5	Resins and resin combination; tannins.		2
	Lipids: fixed oils and waxes.		

Week	Topic	Key Learning Outcomes	Hours
6	Volatile oils: Introduction; chemistry of volatile oils; biosynthesis ofvolatile oils; hydrocarbons as volatile oils; alcohols as volatile oils; aldehydes as volatile oils.	likely to fall within chemical ecology.	4
7	Ketones as volatile oils; Phenols as volatile oils; Oxides as volatile oils; Ester as volatile oils; Phenolic ethers as volatile oils.		3
8	Non- medicinal toxic plants.		2
9	Vitamins and Amino acids.		2

12. Teaching and Learning Resources

Required Textbooks

- Pharmacognosy 9th edition Varro E.Tyler, Lynn R.Brady**.**

Main References

- Phamacognosy 16th edition Trease &Evans.

Recommended Readings

- Phytochemical methods 3th edition Aguide to modern techniques of plant analysis 1998
- Thin layer chromatography 2nd edition Egon stahl. 1990.

.1 Course Name
Biochemistry I
.2 Course Code:
50304304
.3 Semester / Year:
First / third
.4 Date of Course Description Preparation
8/5/2025
.5 Available Attendance Mode
In – person attendance
.6 Total Hours / Total Units:
5 / 4
.7 Course Coordinator Name:
د.سرى عبد الكريم م.م. سارة عودة. رامي محمدم.م.م saifelais18@gmail.com Sara.kashash1605@gmail ramimohammed@gmail.com
.8Course Objectives
• Providing students with biochemistry for important biomolecules and preparing them to discuss the metabolism of these molecules. • Provide students with the necessary technical skills in the field of biochemistry.
.9 Teaching and Learning Strategies

• Presentation and presentation
• Interactive discussions
•Brainstorming
• Research and induction

.10 Course Structure

Course Description

Week	Topic	Key Learning Outcomes	Hours
1	Introduction to the macromolecules biochemistry: Definitions andterms; proteins, enzymes, DNA; Clinical value.	Introduction	3
2	Amino acids: Structures of A.A (table of standard A.A abbreviation and side chain); Classification, properties, isomerism	Amino acids	3
3	Amino acids: Chemical reactions, Zwitter ions, titration curve calculating isoelectric point values. Examples and questions. Nonstandards A.A: Structures, existence and clinical value.	Amino acids	3
4	Peptides: Peptide bond, resonance forms, isomers, physical propertiesand chemical reactions. Essential poly peptides in human body, structures, roles and clinical values	Peptide	3
5	Proteins: Structure and conformations of proteins, Primary structure, Secondary structure (4 helix, 5 sheet), tertiary structure, quaternary structure. Classification, synthesis, cellular functions (Enzymes, cell signaling, and ligand transport, structural proteins), protein in nutrition.	Proteins	3

Week	Topic	Key Learning Outcomes	Hours
6	Denaturation of proteins and protein sequencing: Determining A.A composition, N- terminal A.A analysis, C-terminal A.A analysis, Edman degradation, prediction protein sequence from DNA/ RNA sequences. Methods of protein study: Protein purification, cellular localization, proteomics and bioinformatics, structure predication andsimulation.	Proteins	3
7	Carbohydrates: Chemistry and classification, biomedical importance, classification of CHO, Stereochemistry of monosaccharides, metabolism of CHO; Physiologically important monosaccharides, glycosides, disaccharides, polysaccharides	Carbohydrate	3
8	Lipids: 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	3
9	Enzymes: Structures and mechanism, nomenclature, classification, mechanisms of catalysis, thermodynamics, specificity, lock and key model, induced fit model, transition state stabilization, dynamics and function, allosteric modulation. Biological function, cofactors, coenzymes, involvement in disease	Enzymes	3
10	Kinetics: General principles, factors effecting enzyme rates (substrateconc., pH, temperature, etc), single-substrate reaction (Michaelis- Menten kinetics), kinetic constants. Examples of kinetic questions and solutions	Enzymes	3

Week	Topic	Key Learning Outcomes	Hours
11	Enzyme inhibition: Reversible inhibitors, competitive and non competitive inhibition, mixed-type inhibition, Irreversible inhibition. Inhibition kinetics and binding affinities (*k*i), questions and solutions	Enzymes	3
12	Control of activity and uses of inactivators; multi-substrate reactions, ternary-complex mechanisms, ping-pong mechanisms, non- Michaelis- Menten kinetics, pre-steady-state kinetics, chemical mechanisms	Enzymes	3
13	Nucleic Acid: Chemical structure, nucleic acid components, nucleicacid bases, nucleotides and deoxynucleotides (Properties, base pairing, sense and antisense, super-coiling, alternative structures, quadruple structures.	Nucleic acid	3
14	Biochemistry of extracellular and intracellular communication: Plasma membrane structure and function; Biomedical importance, membraneproteins associated with lipid bilayer, membranes protein composition, dynamic structures of membranes, a symmetric structures of membranes	Plasma mambrane	3
15	Biochemistry of the endocrine system: Classification of hormones,biomedical importance, the target cell concept and hormone receptors, biochemistry of hormone action and signal transduction	Endocrine system	3

12. Teaching and Learning Resources

Required Textbooks

Harper's Illustrated Biochemistry, 32 ed.

Main References

Lippincott Illustrated Reviews: Biochemistry, 7 ed.3

Lehninger Principles of Biochemistry, 8th ed.

Recommended Readings

.1 Course Name
Medical ethics
.2 Course Code:
50305310
.3 Semester / Year:
Second semester / Third stage
.4 Date of Course Description Preparation
10 May 2025
.5 Available Attendance Mode
In-person
.6 Total Hours / Total Units:
9 hrs / 9 units
.7 Course Coordinator Name:
Assistant Lecturer Mazin Abdul-Ridha - Email: mazinalbawoy84@gmail.com
.8Course Objectives
This course provides a general overview of medical ethics and the ethical aspects of the professional work of practicing pharmacists, to enable the student to understand the ethical and legal responsibilities that govern the pharmacist's professional relationship with patients, colleagues, and other healthcare workers, in order to improve healthcare service quality.
.9 Teaching and Learning Strategies
Enabling students to understand ethical issues and related professional dilemmas that pharmacists may face in pharmacies, hospitals, and the community.
.10 Course Structure

Course structure

Week	Topic	Key Learning Outcomes	Hours
1	ntroduction to Pharmacy Ethics and Ethical Dilemmas	History and Definition of Pharmacy Ethics	1
2	Pharmacy Ethics Law	Understand the principles and laws governing pharmacy ethics	1
3	General Ethical Considerations	Recognize general ethical considerations	1
4	Specific Ethical Considerations	Definitions and Examples of Specific Ethical Considerations	1
5	Professional Ethical Considerations	How to build professional ethical considerations	1
6	Ethical Decisions	Types of ethical decisions	1
7	Ethics in Genetic Research	Understanding how ethics play an important role before conducting a genetic study	1
8	Misuse and Abuse of Medication	Definition of improper drug use	1
9	Case Studies in Pharmacy Ethics	Application of ethical considerations and presentation of clinical cases of major ethical problems in patient cases	1

12. Teaching and Learning Resources

Required Textbooks

Robert J. Cipolle, Linda M. Strand, Peter C. Morley. Pharmaceutical Care Practice: The Clinician's Guide

Recommended Readings, and Main References

1.Course notes in medical ethics and low

2.Compelling_Ethical_Challenges_in_Critical_Care_and_Emergency_Me dicine

Online References

- Review articles

- Educational websites

.1 Course Name

Organic Pharmaceutical Chemistry I

.2 Course Code:

5030211210

.3 Semester / Year:

Second semester 2024-2025

.4 Date of Course Description Preparation

September 2024

.5 Available Attendance Mode

On campus

.6 Total Hours / Total Units:

45 / 4

.7 Course Coordinator Name:

Lec.Dr. Mustafa Maher Allawi mostafa_maher@uruk.edu.iq

laboratory

Assist.Lec. Tariq Talal **tariq_sonic@yahoo.com**

Assist.Lec. Tabarak Mohammed tabarkchemist@gmail.com

Assist.Lec. Fatima Salam

.8Course Objectives

1. Highlighting the concept of drug journey inside the body (ADME) 2. Studying drug and chemical metabolism 3. Studying factors affecting drug metabolism 4. Studying Stereochemical Aspects of Drug Metabolism.

.9 Teaching and Learning Strategies

a. **Knowledge 1. Studying the physicochemical and biological factors affecting the drug inside the body. 2. Studying classical and recent strategies of drug design. 3. Studying the different types of biotransformation of drugs inside the body. 4. Studying factors affecting drug metabolism. Learning and teaching methods 1- Theoretical lectures covering all the aspects 2- Conducting reports and research 3- Presentation of practical videos 4 - Use of supporting books 5- Seminars b. Skills 1. Obtaining skills of dealing with the chemical structure of drugs and its effect on drug behavior inside the body 2. Obtaining skills to modify the chemical structure of drugs to enhance**

the action and overcome weak points in the drug properties 3. Obtaining skills of writing scientific reports Learning and teaching methods 1. Lectures 2. Interactive open discussion 3. Demonstrating videos 4. Lab. Experiments and research 5. Supporting references 6. Homework 7. Exams c. Attitude 1. Knowledge-based expectation of drug action and inactivation inside the body 2. Enhancing the ability to think and analyze 3. Working as a research team d. Other skills acquired through the course (related to personal development and employment) 1. Experiencing the making of scientific reports 2. Experiencing literature reading and recent learning methods 3. Experiencing the art of analysis and discussion of results of experiment Learning and teaching method 1- Theoretical lectures 2 -Practical experiences 3-Explanatory videos 4-Scientific discussions through seminars or asking questions Assessments methods 1-Conducting mid-term and final exams 2--Daily oral and written exams 3-Practical laboratory exams (practical - practical and theoretical - practical) 4-Laboratory reports 5- Conducting seminars

58. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	2	Introducing the drug journey inside the body	Drug distribution.	Lectures	oral and written exams
3	4	Demonstrating the effect of pKa of drugs vs. the pH of the environment	Acid-base properties of drugs	Lectures	oral and written exams
4	2	Basic knowledge of in silico drug design	Computer-aided drug design	Lectures	oral and written exams
5	3	The effect of forces and bonds and drug response	Forces involved with drug-receptor interactions.	Lectures	oral and written exams
6	4	Stereochemical aspects of drug molecules vs. the receptor	Steric features of drugs	Lectures	oral and written exams
7	4	Effect of isosteric replacements of atoms within drug molecules	Isosterism	Lectures	oral and written exams
8-15	1	Types of metabolism. Site of metabolism	General pathways of drug metabolism: Sites of drug biotransformation.	Lectures	oral and written exams
	1	Role of cytochrome P450 mono-oxygenases			
	9	Studying the -Oxidation of Aromatic Moieties Oxidation of Olefins -Oxidation at Benzylic Carbon Atoms —Oxidation at Allylic Carbon Atoms	Role of cytochrome P450 mono-oxygenases	Lectures	oral and written exams

	2	-Oxidation at Carbon Atoms α to Carbonyls and Imines -Oxidation at Aliphatic and Alicyclic Carbon Atoms -Oxidation involving Carbon–Heteroatom Systems -Oxidation of carbon-nitrogen system -Oxidation of carbon-oxygen system -Oxidation of carbon-sulfur system -Oxidation of Alcohols and Aldehydes -Other Oxidative Biotransformation Pathways	in oxidative biotransformation Oxidative reactions	Lectures	oral and written exams
	2	Studying the -Reduction of Aldehyde and Ketone Carbonyls -Reduction of Nitro and Azo Compounds -Miscellaneous Reductions	Reductive reactions	Lectures	oral and written exams
	6	Studying the -Hydrolysis of Esters and Amides -Miscellaneous Hydrolytic Reactions -Miscellaneous Bioactivation of prodrug Studying the -Glucuronic Acid Conjugation -Sulfate Conjugation -Conjugation with Glycine, Glutamine, and Other Amino Acids -GSH or Mercapturic Acid Conjugates -Acetylation -Methylation	Hydrolytic reactions Phase II reactions	Lectures	oral and written exams
	2	Studying the factors affecting drug metabolism	Factors affecting drug metabolism.	Lectures	oral and written exams
	1	Studying the of stereochemistry on metabolism	Stereochemical Aspects of Drug Metabolism	Lectures	oral and written exams
	1	Studying the metabolism of pharmacologically active drug			

			Pharmacologically Active Metabolites	lectures	oral and written exams

59. 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 marks for practical work in the lab and quizzes

20 marks for mid-term exam and quizzes and oral discussions

60 marks for final term exam

60. Learning and Teaching Resources

Required textbooks (curricular books any)	Wilson and Gisvold Textbook of Organic medicinal and Pharmaceu chemistry, Delgado JN, Remers WA, (Eds); 12th ed, 2011
Main references (sources)	Wilson and Gisvold Textbook of Organic medicinal and Pharmaceu chemistry, Delgado JN, Remers WA, (Eds); 12th ed, 2011
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://www.sciencedirect.com/book/9780128128381/organic-chemistry

.1 Course Name
Biochemistry II
.2 Course Code:
50304309
.3 Semester / Year:
Second / Third
.4 Date of Course Description Preparation
7 /5 / 2025
.5 Available Attendance Mode
In-person Attendance
.6 Total Hours / Total Units:
5/4
.7 Course Coordinator Name:
د.سرى عبد الكريم م.م. سارة عودة. رامي محمدم.م.م saifelais18@gmail.com Sara.kashash1605@gmail ramimohammed@gmail.com
.8Course Objectives
Providing students with biochemistry for important biomolecules and preparing them to discuss the metabolism of these molecules. • Provide students with the necessary technical skills in the field of biochemistry
.9 Teaching and Learning Strategies
Presentation and presentation • Interactive discussions •Brainstorming • Research and induction

.10 Course Structure

Course Description

Week	Topic	Key Learning Outcomes	Hours
1	Bioenergetics.	Introduction	3
2	Biologic oxidation.	Metabolism & metabolic level	3
3	The respiratory chain and oxidative phosphorylation.	Electron Transport Chain	3
4	Over view of metabolism.	Fuel & metabolism	3
5	Citric acid Cycle.	Reactions of TCA cycle	3
6	Glycolysis.	Reactions of glucose	3
7	Metabolism of glycogen.	Reactions of glycogen	3
8	Gluconeogenesis.	Production of glucose inside the body	3
9	Pentose phosphate pathway and other pathways of hexosemetabolism.	Production of reducing equivalent	3
10	Biosynthesis of fatty acids.	Production of lipid	3

Week	Topic	Key Learning Outcomes	Hours
11	Oxidation of fatty acids.	Catabolism of lipids	3
12	Metabolism of acylglycerol and sphingolipids.	Reaction of phospholipid	3
13	Lipid transport and storage.	Transporting of lipids	3
14	Cholesterol synthesis, transport, and excretion.	Production of cholesterol inside the body	3
15	Biosynthesis of the Nutritionally Nonessential Amino Acids. Catabolism of Proteins & of Amino Acid Nitrogen	Reaction of amino acids	3

12. Teaching and Learning Resources

Required Textbooks

Harper's Illustrated Biochemistry, 32 ed.

Main References

Lippincott Illustrated Reviews: Biochemistry, 7 ed.3

Lehninger Principles of Biochemistry, 8th ed.

Recommended Readings

نموذج وصف المقرر

- Course Name
Pharmaceutical technology II
Course Code:
50303308
Semester / Year:
Second course / 3ed stage
Date of Course Description Preparation
5-2025
Available Attendance Mode
حضوري
Total Hours / Total Units
ثلاث ساعات نظري / ساعتان عملي
Course Coordinator Name:
النظري / م.د. اسماء محمد رشيد asmaamohammad@uruk.edu.iq العملي / م.م. هبة محمد سوزه heba_mohamed@uruk.edu.iq م.م. حوراء كريم خفيف hawraa.k.khafif@uruk.edu.iq
Course Objectives

اهداف المادة الدراسية	الاهداف المعرفية تعلم الاسس النظرية لتقنية تحضير الاشكال الصيدلانية المختلفة من حيث موادها الاولية و تركيباتها و طرق تحضيرها و ثباتها و تخزينها و استخداماتها . في نهاية الفصل الدراسي , من المتوقع ان يتعلم الطالب : ان يكون قادرا على التمييز بين الانواع المختلفة لانظمة التشتت , الجزيئية و الغروية و الخشنة تمكين الطالب من اعداد محاليل بسيطة ان يكون قادرا على اجراءات الحسابات اللازمة لاعداد نماذج الجرعات الصيدلانية ان يكون قادرا على التمييز بين الاشكال الصيدلانية القدرة على اختيار الطريقة و الاضافات المناسبة لتحضير الاشكال الصيدلانية القدرة على اختيار الشكل الصيدلاني المناسب للمكونات النشطة.
1. ستراتيجيات التعليم والتعلم	
الاستراتيجية	محاضرات مناقشة الامتحانات اليومية التقارير

2. بنية المقرر

الاسبوع	الساعات	مخرجات التعلم المطلوبة	الوحدة/الموضوع	طريقة التعلم	طريقة التقييم
1-2	4 محاضرة 2 مختبر	• Define the pharmaceutical emulsions • Distinguish	Emulsion	محاضرة نظري تعليم مختبري مناقشات جماعية	الامتحان الشفوي الامتحان التحريري اختبارات اعداد التقارير

			between the different types of pharmaceutical emulsions based on their physical state • Differentiate between the different types of pharmaceutical emulsions based on their intended uses. • Compare and contrast emulsification theories: surface tension, oriented wedge, and Interfacial film. • Compare and contrast various Emulsion types of emulsifying agents • Identify the methods and techniques employed in preparing of stable pharmaceutical emulsions. Identify the factors that affect the stability of emulsion, such as temperature and environmental conditions.		
المناقشات اختبارات اعداد التقارير	محاضرة نظري	Suppositories and Inserts	Compare and contrast various suppository and insert, in terms of physical appearance, size and shape • Describe the advantages of suppositories and inserts. • Identify and explain physiologic factors that influence the drug absorption from rectal suppository administration • Identify and explain the physicochemical Suppositories and Inserts	3 محاضرة 2 مختبر	3-4

			factors of the drug and suppository/insert base as these influence absorption • Compare and contrast the various classes of suppository bases Describe the three methods of suppository preparation.		
المناقشات اختبارات اعداد التقارير	محاضرة نظري	Semi solid dosage form	• Differentiate between the various types of semisolid bases on the basis of physical and chemical properties. • List the criteria for the selection of a semisolid base to treat a topical affliction. • Describe the methods to incorporate (an) active ingredient(s) into a semisolid base. • Explain the difference between an ointment, a cream, and a gel. Semi- solid dosage forms • Compare and contrast an ophthalmic ointment base and a topical ointment base for application to the skin	5 محاضرة 4مختبرت	4-5
المناقشات اختبارات اعداد التقارير	محاضرة نظري	Powders and granules	• Differentiate a powder from a granule. • Explain how a drug's powder particle size influences the pharmaceutical dosage forms which will be used to administer it. • Define micrometrics, the	4 محاضرات ومختبرين	5-6

			angle of repose, levigation, spatulation, and trituration. • Compare and contrast the various types of medicated powders, e.g., bulk, divided. • Provide examples of medicated powders used in prescription and nonprescription product		
المناقشات اختبارات اعداد التقارير	محاضرة نظري	capsule	- Differentiate between hard and soft gelatin capsule. Understand the advantages and disadvantages of each type of capsule Identify the excipients used for both type of capsules Recognize the compendial requirement of capsules Understand the appropriate method for compounding and packaging and storage of capsules	3 محاضرة ومختبرين	6-7
Mid term exam			7-8		
المناقشات اختبارات اعداد التقارير	محاضرة نظري	Aerosols and foam	• Define aerosols Understand the types and applications of aerosols • Identify the main advantage of aerosols • Define foams • Explore the types and applications of foams • Identify the main advantage of foams • Differentiate between aerosols and foams	4 محاضرة ومختبرين	9-10
		Physicochemical drug interactions and incompatibilities	• This topic discusses the drug interactions from a physicochemical rather than a pharmacological or pharmacodynamic	5 محاضرة ومختبرين	11-12

			viewpoint. Sometimes the interaction is beneficial and sometimes not. ● In reading this topic, you should appreciate that there are several causes of interactions and incompatibilities, which include: ● pH effects ● Change of solvent ● Cation_–_anion interactions ● Salting-out and salting-in ● Chelation ● Ion-exchange interactions ● Adsorption to excipients and container		
			Final exam		13-15
تقييم المقرر					
امتحان نصف الكورس و امتحان قصير 20 درجة المختبر العملي 20 درجة الامتحان النهائي 60 درجة					
مصادر التعلم و التدريس					
الكتاب المنهجي المطلوب			Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems Eleventh Edition		
المراجع الرئيسية (المصادر)			Aulton's Pharmaceutics: The Design and Manufacture of Medicines, 3ed Michael E. Aulton (Author). Churchill, Livingstone-Elsevier British Pharmacopeia BP United stated Pharmacopeia USP		
الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية , التقارير)			Physiochemical Principles of Pharmacy Alexender T Florence, David Attwood 4th Edition Chapter 10 (2006) 5th Edition Chapter 11(2011)		
مصادر مكتبية			مصادر الكترونية		

.1 Course Name
Pharmacognosy III
.2 Course Code:
50306311
.3 Semester / Year:
1st Semester/2024-2025
.4 Date of Course Description Preparation
9/2024
.5 Available Attendance Mode
Official attendance time
.6 Total Hours / Total Units:
Theory 2 hours (10 hrs. a week for 5 groups) Laboratory 2 hours (20 hrs. a week for 10 sub-groups)
.7 Course Coordinator Name:
• **Theoretical presenter:** Assist. Lec. Nour Rasim Esmail dr.noor_rasim@uruk.edu.iq • **Lab. Presenters:** 1. Assist. Lec. Raheeq Khairy Abdullah raheeq.kairy.abdullah@uruk.edu.iq 2. Leena Tariq Abdulameer Loloalshammari25m@gmail.com
.8Course Objectives
This course is intended to study chemistry of other natural products namely alkaloids and antibiotics. Also this course includes studying phytotherapy & tissue culturetechniques utilized for production of natural products.
.9 Teaching and Learning Strategies

Presentations
Interactive Discussions
Brainstorming
Research and Induction
Small Groups
Discussion Panels
Volunteer Work

.10 Course Structure

Course Description

Week	Topic	Key Learning Outcomes	Hours
1	Alkaloids: Introduction; Physical and chemical properties; pyridine,piperidine alkaloids; tropane alkaloids.	Study of the chemistry of natural products, including alkaloids and antibiotics, and knowledge of the biosynthesis methods of these active substances, their chemical and physical properties, and detection methods. It also includes the study of phytotherapy and tissue culture techniques used in the production of natural products.	5
2	Alkaloids: Quinoline tropan alkaloids; iso-quinoline alkaloids;imidazole alkaloids; indole alkaloids.		5
3	Alkaloids: Steroidal alkaloids; lupinane alkaloids; alkaloidal amines; purine alkaloids.		4
4	Alkaloids: Steroidal alkaloids; lupinane alkaloids; alkaloidal amines; purine alkaloids.		6
5	phytotherapy :Introduction , principles,medicinal plants in selected health care systems.Important natural products & phytomecines used in pharmacy & medicine		10

12. Teaching and Learning Resources /Reference text:

- Robbers JE, Speedie MK, Tyler VE (Eds.); Pharmacognosy and Pharmacobiotechnology; the latest edition.

- Michael Heinrich, Joanne Barnes; Fundamentals of Pharmacognosy & Phytotherapy.

Course Description

1. Course Name:
Pathology
2. Course Code:
50304303
3. Semester / Year:
3rd / 2nd
4. Description Preparation Date:
February 2025
5. Available Attendance Forms:
In-Person
6. Number of Credit Hours (Total) / Number of Units (Total)
3 (2 Theoretical + 2 Practical)
7. Course administrator's name (mention all, if more than one name)
Name: dr. Mustafa hamodi Dr.sala jafer Dr. alyaahussien Dr.ruaa mohammed Email: mostafahamodui@gmail.com salajafer@gmail.com alyaahussein@uruk.edu.iq Ruaa.mohammed@uruk.edu.iq
8. Course Objectives
• **To introduce students to basic pathological processes and disease mechanisms.** • **• To understand cellular injury, inflammation, neoplasia, and tissue repair.** • **• To learn how pathological changes affect organ function.** • **• To correlate clinical features with pathological findings.**
9. Teaching and Learning Strategies
Lectures with histological images • Case-based discussions • Microscopy and practical lab work • Assignments and group presentations
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction to pathol and cell injury	Introduction pathology and injury	Lecture + La	Participation
2	3	Cell death: necr and apoptosis	Cell death: necr and apoptosis	Lecture Histology	Quiz
3	3	Acute and chr inflammation	Acute and chr inflammation	Lecture Examples	Assignment
4	3	Tissue repair wound healing	Tissue repair wound healing	Lecture + La	Short test
5	3	Midterm Exam	Midterm Exam	—	Written Exa
6	3	Hemodynamic disorders thrombosis	Hemodynamic disorders thrombosis	Lecture + C study	Worksheet
7	3	Neoplasia tumor classifica	Neoplasia tumor classifica	Lecture + Sl	Oral quiz
8	3	Systemic pathology: cardiovascular respiratory	Systemic pathology: cardiovascular respiratory	Lecture Histology	Practical rep
9	3	Final review exam preparatio	Final review exam preparatio	Lecture Discussion	Final test

11. Course Evaluation

Midterm Exam: 20%
• Assignments and Participation: 20%
• Final Exam: 60%
Total: 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if ar	Main Reference: Robbins Basic Pathology, 10th Edition. • Supplementary: Lecture Notes and Histopathology Atlas.

Cours Description

.1 Course Name
Pharmacology I
.2 Course Code:
50301306
.3 Semester / Year:
2nd Semester / 3rd Stage
.4 Date of Course Description Preparation
February 1, 2025
.5 Available Attendance Mode
In-person
.6 Total Hours / Total Units:
3 hours theoretical / Total units = 3
.7 Course Coordinator Name:
Dr. Reem Ghanim Hussein **Email: Reemghanem@uruk.edu.iq**
.8 Course Objectives
• The course aims to: • Define and understand the science of pharmacology. • Study drug kinetics and mechanisms of action. • Provide an introductory overview of the nervous system and drugs affecting it, and introduce major groups of antimicrobial, antifungal, and antiparasitic agents
.9 Teaching and Learning Strategies
• Detailed explanation of scientific content. • Student participation in discussion. • Interactive dialogue around relevant concepts

Week	Hours	Learning Outcomes	Topic	Learning Method	Assessment
1	3	Understand basic pharmacokinetics and clinical drug movement	Pharmacokinetics	Lecture + Educational slides	Weekly quizzes + oral exams
2	3	Identify drug-receptor interactions	Drug-Receptor Interactions & Pharmacodynamics	Lecture + Educational slides	Weekly quizzes + oral exams
3	3	Understand physiology of neurotransmission	The Autonomic Nervous System	Lecture + Educational slides	Weekly quizzes + oral exams
4	3	Understand cholinergic agonist drugs	Cholinergic Agonists	Lecture + Educational slides	Weekly quizzes + oral exams
5	3	Understand cholinergic antagonist drugs	Cholinergic Antagonists	Lecture + Educational slides	Weekly quizzes + oral exams
6	3	Understand adrenergic agonist drugs	Adrenergic Agonists	Lecture + Educational slides	Weekly quizzes + oral exams
7	3	Understand adrenergic antagonist drugs	Adrenergic Antagonists	Lecture + Educational slides	Weekly quizzes + oral exams
8	3	Understand principles of antimicrobial therapy	Antimicrobial Therapy Principles	Lecture + Educational slides	Weekly quizzes + oral exams
9	3	Understand inhibitors of cell wall synthesis	Cell Wall Inhibitors	Lecture + Educational slides	Weekly quizzes + oral exams
10	3	Understand protein synthesis inhibitors	Protein Synthesis Inhibitors	Lecture + Educational slides	Weekly quizzes + oral exams
11	3	Understand quinolones, folic acid antagonists, and urinary antiseptics	Quinolones, Folic Acid Antagonists, Urinary Tract Antiseptics	Lecture + Educational slides	Weekly quizzes + oral exams
12	3	Understand tuberculosis treatment agents	Antimycobacterial Drugs	Lecture + Educational slides	Weekly quizzes + oral exams
13	3	Understand antifungal therapy	Antifungal Drugs	Lecture + Educational slides	Weekly quizzes + oral exams
14	3	Understand antiparasitic therapy	Antiprotozoal Drugs	Lecture + Educational slides	Weekly quizzes + oral exams
15	3	Understand anthelmintic therapy	Anthelmintic Drugs	Lecture + Educational slides	Weekly quizzes + oral exams

11. Course Evaluation

Mid 25%
Evaluation 5%
Final 70%

12. Learning and Teaching Resources

Required Textbook

- **Prescribed Textbook (if available):**
  Lippincott® Illustrated Reviews: Pharmacology, 8th Edition, 2023
- **Main Reference:**
  Same as the prescribed textbook
- **Recommended Additional Resources:**
  - Scientific journals and periodic reports
  - Core pharmacology resources available online or in updated textbooks
- **Electronic Resources and Websites:**
  - YouTube
  - ResearchGate
  - Google Scholar
-

Course Description Form

1. Course Name:
Biopharmaceutics
2. Course Code:
503 03 403
3. Semester / Year:
First Semester / Fourth Year
4. Description Preparation Date:
01-02-2025
5. Available Attendance Forms:
Official in-person attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
2 / 2 (2)
7. Course administrator's name (mention all, if more than one name)
Lecturer: Hala Sadeq Yousif Ali (hala_sadiq@uruk.edu.iq) Lecturer Dr. Mohammad Laith Hamzah (mohammad.laith.hamza@uruk.edu.iq) Assistant Lecturer Sudad Abdul-Hameed Mohammed (sudadm@yahoo.com) Assistant Lecturer Mukhles Munther Istefan(mukhlesmunther1999@gmail.com)
8. Course Objectives
The course covers the physical and chemical properties of pharmaceutical substances, dosage form, and the biological effectiveness of a drug or pharmaceutical product upon administration—including the drug's availability in the human or animal body from a specific dosage form. **It also includes pharmacokinetics, focusing on the time course of the drug in the biological system and the quantitative estimation of drug concentration patterns in healthy individuals and specific pathological conditions……**
9. Teaching and Learning Strategies

Strategy	1. Group presentations and peer assessments 2. Time management exercises 3. Workshops on professional development

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction biopharmaceutics.	Introduction biopharmaceutics.	Lec.	Quizz
2	2	Biopharmaceutic aspects of produ drug absorpti mechanisms absorption; physicochemical factors; dissolut rate; effects excipients; type dosage forms.	Biopharmaceutic aspects of produ drug absorpti mechanisms absorption; physicochemical factors; dissolut rate; effects excipients; type dosage forms.	Lec	Quizz
3	2	One compartment o model.	One compartment o model.	Lec	Quizz
4	2	Multicompartment models.	Multicompartment models.	Lec	Quizz
5	2	Pharmacokinetics drug absorption.	Pharmacokinetics drug absorption.	Lec	Quizz
6	2	Bioavailability bioequivalence.	Bioavailability bioequivalence.	Lec	Quizz
7	2	Clearance of dr from the biolog systems.	Clearance of dr from the biolog systems.	Lec	Quizz
8	2	Hepatic elimination drugs.	Hepatic elimination drugs.	Lec	Quizz
9	2	Protein binding drugs.	Protein binding drugs.	Lec	Quizz
10	2	Intravenous infusion	Intravenous infusion	Lec	Quizz
11	2	Multiple dos regimens.	Multiple dos regimens.	Lec	Quizz

11. Course Evaluation

Mid:20%
Pra. 20%
Final 60%

.1 Course Name
Clinical Pharmacy 1
.2 Course Code:
50305405
.3 Semester / Year:
First Semester / Fourth Stage
.4 Date of Course Description Preparation
September 2024
.5 Available Attendance Mode
In-person
.6 Total Hours / Total Units:
2 hours per group (8 hours for four groups) / Total Units = 3
.7 Course Coordinator Name:
1. Name: Dr. Inas Rifaat Ibrahim Email: dr.inasibrahim@uruk.edu.iq 2. م.د. مصطفى كاظم م.د. علياء حسين 3. م. مازن عبد الرضا. 4. mustafa_kazem@uruk.edu.iq alyaahussein@uruk.edu.iq mazenabdulruda@gmail.com
.8Course Objectives
• This course provides students with essential knowledge and skills in community pharmacy management and practice
.9 Teaching and Learning Strategies

· Lectures
· Seminars
· Quizzes
· Brainstorming questions

.10 Course Structure

Course Description

Week	Topic	Learning Outcomes	Teaching Method	Assessment
1	Introduction to Community Pharmacy	- Differentiate between prescription and over-the-counter medications. - Understand symptom response in community pharmacy. - Learn general rules for patient referral.	Lectures, Discussions	Simple quizzes
2	Respiratory Problems: Cough, Cold, Allergic Rhinitis, Otitis Media, Laryngitis, Pharyngitis	- Identify causes and symptoms of common minor respiratory issues. - Recognize red flag symptoms requiring referral. - Recommend non-drug and OTC drug treatments. - Provide appropriate patient counseling.	Lectures, Discussions	Simple quizzes
3	Gastrointestinal Issues: Diarrhea, Constipation, Heartburn, Indigestion, IBS, Hemorrhoids	- Understand causes/symptoms of GI complaints. - Identify alarm symptoms. - Recommend suitable OTC and non-drug	Lectures, Discussions	Simple quizzes

Week	Topic	Learning Outcomes	Teaching Method	Assessment
		therapies. - Counsel patients effectively.		
4	Pediatric Care: Oral Thrush, Pinworms, Head Lice	- Recognize causes/symptoms of common minor pediatric conditions. - Know when to refer. - Suggest suitable OTC and non-drug treatments. - Provide proper counseling.	Lectures, Discussions	Simple quizzes
5	Dermatological Conditions: Acne, Scabies, Psoriasis, Hair Loss, Fungal Infections, Eczema, Dandruff, Cold Sores, Corns, Calluses	- Describe causes/symptoms of common skin conditions. - Identify symptoms requiring referral. - Recommend treatments and patient advice.	Lectures, Discussions	Simple quizzes
6	Women's Health: Cystitis, Vaginal Thrush, Primary Dysmenorrhea, Premenstrual Syndrome	- Identify common women's health issues and their management. - Know when referral is needed. - Recommend OTC options and patient advice.	Lectures, Discussions	Simple quizzes
7	CNS Problems: Headache, Insomnia, Motion Sickness, Nausea, Vomiting	- Understand symptoms and causes of minor CNS issues. - Identify red flags. - Recommend OTC and lifestyle changes.	Lectures, Discussions	Simple quizzes
8	Eye Problems	- Recognize symptoms of minor eye issues. - Know when to refer. - Recommend appropriate OTC treatment.	Lectures, Discussions	Simple quizzes
9	ENT Problems: Nose, Ear, Throat	- Discuss common ENT symptoms and treatments. - Identify when referral is	Lectures, Discussions	Simple quizzes

Week	Topic	Learning Outcomes	Teaching Method	Assessment
		needed. - Provide counseling.		
10	Oral Hygiene and Mouth Ulcers	- Identify oral problems and symptoms. - Recommend OTC and non-drug treatments.	Lectures, Discussions	Simple quizzes
11	Obesity and Weight Management	- Understand causes and complications of obesity. - Know benefits of weight loss and OTC/non-drug options.	Lectures, Discussions	Simple quizzes
12	Musculoskeletal Pain and Disorders	- Identify causes of muscle and joint pain. - Recommend suitable therapies.	Lectures, Discussions	Simple quizzes
13	Nicotine Replacement Therapy (NRT)	- Explain smoking health risks. - Describe quitting benefits and theoretical models. - Guide patients in NRT use.	Lectures, Discussions	Simple quizzes
14	Dietary Supplements	- Describe supplement market, regulation, risks, and quality.	Lectures, Discussions	Simple quizzes
15	Updates on the Reclassification of OTC Drugs	- Discuss recent OTC reclassification and guidance.	Lectures, Discussions	Simple quizzes

11. Course Evaluation

- Midterm Exam: 20%
- Lab Work: 20%
- Final Exam: 60%

12. Teaching and Learning Resources

Main References:

- Symptoms in Pharmacy: A Guide to the Management of Common Illness
- Community Pharmacy: Symptoms, Diagnosis and Treatment

Recommended Reading:

- Handbook *of Nonprescription Drugs: An Interactive Approach to Self-Care*
- Electronic books and review articles
- Trusted online sources and databases

Course Description

1- Course Title:
Organic Pharmaceutical Chemistry II
2- Course Code:
503 02 402
3- Semester / Year
First Semester / Fourth Stage
4- Date of Description Preparation:
2025-02-1
5- Available Attendance Modes:
Official Full-Time Attendance
6-Total Study Hours / Total Units:
3 hours for theoretical lectures (12 hours per week for four sections) **2 hours for practical lab sessions (16 hours per week for eight sections)**
7-Course Coordinator(s) (If more than one, please specify):
Dr. Nadeem Abdalsatr Abdalrazaq (Lecturer for Theoretical Curriculum) **Email: dr.nadeem_mrmr@uruk.edu.iq** **Teaching Staff for Practical Curriculum** **Dr.Mustafa maher** Email:**Mostafa_maher@uruk.edu.iq** **Ass.lect. Taberk Mohammed** **Email:tabarkchemist@gmail.com**
8-Course Objectives:

- Knowledge of biological activities, if any. **- Predicting the biological response.** **- Knowledge of the chemistry of different groups of studied drugs, the relationship between chemical structure and biological activity of drugs.** **- Knowledge of some drug categories, including preparation procedures, identity, and testing.** **- Explaining how to avoid undesirable side effects of the studied drugs.**	**Objectives of the Course Material**
9-Teaching and Learning Strategies	
- Lectures **- Oral discussions** **- Examinations** **- Reports**	**Strategy**
10-Course Structure:	

Assessment method	Teaching methods	Intended learning outcomes	Unit/ topic name	hours	week
Quizzes	Lectures	Cholinergic receptors and their subtypes. stereochemistry and structure activity relationships (SAR); products.		3	1
Quizzes	Lectures	Cholinesterase inhibitors. structure-activity relationships (SAR).Solanaceous		3	2
		alkaloid and analogues, synthetic cholinergic blocking agents, products			
Quizzes	Lectures	Ganglionic blocking agents (neuromuscular blocking agents.		3	3
Quizzes	Lectures	Structure and Physicochemical Properties, Biosynthesis Storage, Release, Uptake, and Metabolism		3	4
Quizzes	Lectures	α-Adrenergic Receptors, β-Adrenergic Receptors Drugs Affecting Catecholamine Biosynthesis		3	5
Quizzes	Lectures	Drugs Affecting Catecholamine Storage and Release, Direct-Acting Sympathomimetic endogenous catecholamines (SAR)		3	6
Quizzes	Lectures	α -adrenergic receptor agonists . β-adrenergic receptor agonists, and Indirect-Acting Sympathomimetics. α –blockers,		3	7
Mid Examination					8

Quizzes	Lectures	Nonselective α – blockers, Irreversible α-blockers, Selective α 1-blockers.β-blockers, nonselective β-blockers.		3	9
Quizzes	Lectures	Structure–Activity Relationships Of NSAIDs, Mechanism of Action and NSAID-Induced Side Effects, enzymatic structure of		3	10
Quizzes	Lectures	Cyclooxygenases, classes of COX inhibitor,		3	11
Quizzes	Lectures	SAR of morphine, meperidine, type molecules, methadone , type molecules, N-methyl-benzomorphans, antagonist type analgesics in benzomorphans		3	12
Quizzes	Lectures	endogenous opioids, structure-activity relationships (SAR), Products and. Antitusive agents.		3	13
Quizzes	Lectures	. CNS depressant; Benzodiazepines and related compounds. Analeptics, central sympathomimetic Agents, methyl xanthine. Barbiturates. Mechanism of action of Antipsychotics.		3	14
Quizzes	Lectures	Anticonvulsants, Clinically important Anticonvulsants. Biological Activities of Mineralocorticoids and Glucocorticoids, Steroids Sex Hormones,progestins and androgens		3	15
Final exam of the semester					

11-Course Assessment:	
	Sudden oral and written tests. Practical exams after conducting each experiment. Theoretical midterm exam. Theoretical final exam.
12- Learning and Teaching Resources:	
Required Textbooks	

1. Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry 12^{ve} ed. John M. Beale, Jr., John H. Block, 2. Faye's Principles of Medicinal Chemistry by David A. Williams and Thomas L.Lemke	**Main References (Sources):**
• Advanced practical medicinal chemistry by Ashutosh Kar. • Lab Hand Book For Practical pharmaceutical chemistry Adopted by the Department by Assist .Prof. Karima Fadhil Ali / 2015	**a. Books and References**
Google searching for organic Pharm chemistry	**b. Electronic References, Websites**

Cours Description

.1 Course Name
Pharmacology II
.2 Course Code:
50301401
.3 Semester / Year:
Second Semester / Fourth Stage
.4 Date of Course Description Preparation
February 1, 2025
.5 Available Attendance Mode
In-person
.6 Total Hours / Total Units:
3 hours theoretical (12 hours per week for four sections) / Total units = 4
.7 Course Coordinator Name:
Name: Dr. Hamoodi Alawi Mousa **Email: dr.hamoodialewi@uruk.edu.iq**
.8 Course Objectives
• **Enable graduating students to communicate effectively with patients and healthcare professionals during all phases of medical treatment.** • **Equip students to educate patients about their medications, including drug instructions, and help eliminate any obstacles preventing proper medication use.**
.9 Teaching and Learning Strategies
• **Seminars** • **Educational Labs** • **Lectures** • **Case Discussions**

Week	Topic	Learning Outcome	Hours
1	Introduction to the Nervous System	Understand the fundamentals of the nervous system	3
2	Anxiolytics	Understand anti-anxiety medications	3
3	Antidepressants	Understand antidepressant drugs	3
4	Antipsychotics	Understand antipsychotic drugs	3
5	Anesthetics	Understand anesthetic drugs	3
6	Central Analgesics	Understand centrally acting analgesics	3
7	Anti-Parkinson Drugs	Understand medications for Parkinson's disease	3
8	Antiepileptics	Understand antiepileptic medications	3
9	**Midterm Exam**	—	—
10	Antihypertensives	Understand drugs for blood pressure control	3
11	Heart Failure Drugs	Understand drugs for heart failure	3
12	Antianginals	Understand drugs used in angina	3
13	Antilipidemics	Understand drugs for high cholesterol	3
14	Antiarrhythmics	Understand drugs for heart palpitations	3
15	Anticoagulants	Understand drugs affecting blood clotting	3
16	**Final Exam**	—	—

11. Resources and References

1. Required Textbooks:

- *Pharmacology; Lippincott, Latest edition 2019*

2. Main References:

- *Pharmacology; Katzung, Latest edition*

3. Supplementary Resources:

- Online sources and new drug updates
- Scientific journals and reports
- Reliable internet websites

12. Course Development Plan

The unified national curriculum is followed, but lectures are updated using the most recent editions of key pharmacology references and textbooks.

Course Description

.1 Course Name
Clinical Pharmacy II
.2 Course Code:
50305410
.3 Semester / Year:
Second Semester / Fourth Stage
.4 Date of Course Description Preparation
January 2025
.5 Available Attendance Mode
In-person
.6 Total Hours / Total Units:
2 hours per group (8 hours for four groups) / Total Units = 3
.7 Course Coordinator Name:
1. Name: Dr. Inas Rifaat Ibrahim **2. Email: dr.inasibrahim@uruk.edu.iq** **3. م.د. مصطفى كاظم** **4. م.د. علياء حسين** **5. م. مازن عبد الرضا.** **6. mustafa_kazem@uruk.edu.iq** **7. alyaahussein@uruk.edu.iq** **8. mazenabdulruda@gmail.com**
.8Course Objectives
• To provide students with essential knowledge of pathophysiology, symptoms, and therapeutic goals. • To understand drug use, pharmacokinetics, drug interactions, dose calculations, adverse effects, treatment algorithms, and patient education. • The course covers selected diseases from: ❖ Cardiovascular disorders ❖ Respiratory disorders ❖ Gastrointestinal disorders ❖ Infectious diseases ❖ Rheumatologic disorders ❖ Endocrine disorders
.9 Teaching and Learning Strategies
Lectures **Seminars** **Quizzes** **Brainstorming questions**
.10 Course Structure

Week	Topic	Key Learning Outcomes
1	Introduction to Clinical Pharmacy & Professional Roles (focus on Iraq)	Understand the principles and specializations of clinical pharmacy.
2	Overview of Pharmaceutical Care Practice	Define pharmaceutical care and the steps to achieve therapeutic goals.
3	Blood Disorders: Anemia & Sickle Cell Disease	Recognize causes, diagnosis, treatment plans, iron preparations, and drug monitoring.
4	Hypertension	Define BP goals, causes, classification, therapy selection, and monitoring plans.
5	Ischemic Heart Disease	Understand risk factors, stable angina vs ACS, treatment goals, and drug monitoring.
6	Heart Failure	Differentiate types, causes, neurohormonal mechanisms, NYHA/ACC staging, and design evidence-based drug/non-drug plans.
7	Peripheral Arterial Disease	Identify risk factors, pathophysiology, and formulate treatment plans.
8	Asthma	Define symptoms, triggers, treatment goals, device selection, and personalized action plans.
9	COPD	Understand pathophysiology, symptom assessment, and design both maintenance and exacerbation therapy.
10	Diabetes & Diabetic Ketoacidosis	Distinguish types, treatment goals, insulin selection, oral agents, and patient-specific plans.
11	Peptic Ulcer Disease	Compare ulcers (H. pylori vs NSAIDs), treatment regimens, risk assessment, and monitoring plans.
12	Tuberculosis	Assess risk factors, drug regimens, adverse effects, and lab monitoring.
13	Meningitis	Pathophysiology, symptoms, pathogens, empiric therapy, and monitoring strategies.
14	Respiratory Tract Infections	CAP, HAP, VAP: causes, host defenses, empiric therapy design, and preventive vaccination.
15	Gastrointestinal Infections	Epidemiology, treatment plans, antimicrobial resistance, immunocompromised risks, and prevention.
16	Gout and Hyperuricemia	Recognize triggers, design acute and maintenance therapy, monitor response, and patient education.
17	Arthritis (OA & RA)	Define pathophysiology, clinical features, treatment goals, non-drug and drug therapy, and monitoring.
18	Osteoporosis and Metabolic Bone Diseases	Risk factors, fracture pathophysiology, diagnosis, treatment options, and monitoring plans.
19	Infective Endocarditis	Causes, symptoms, lab findings, pathogen identification, and antibiotic prophylaxis.
20	Surgical Antimicrobial Prophylaxis	Recommend perioperative antibiotics based on surgery type and pathogen risks.

Week	Topic	Key Learning Outcomes
21	Urinary Tract Infections	Define uncomplicated vs complicated UTIs, diagnosis, empiric therapy, and culture-guided treatment.

11. Course Evaluation

- Midterm Exam: 20%
- Lab Work: 20%
- Final Exam: 60%

12. Learning and Teaching Resources

Required Textbooks

- *Pharmacotherapy: A Pathophysiologic Approach*
- *Pharmacotherapy: Principles and Practice*
- *Applied Therapeutics*
- *Clinical Pharmacy and Therapeutics*
- *Pharmacotherapy Handbook*
- *ACCP Updates in Therapeutics*

Recommended Reference:

- Review articles
- E-books
- Websites and online resources

Course Description Template

1-Course Title:
Organic Pharmaceutical Chemistry III
2- Course Code:
503 02 408
3- Semester / Year
Second Semester / Fourth Stage
4- Date of Description Preparation:
2025-02-1
5- Available Attendance Modes:
Official Full-Time Attendance
6-Total Study Hours / Total Units:
3 hours for theoretical lectures (12 hours per week for four sections) **2 hours for practical lab sessions (16 hours per week for eight sections)**
7-Course Coordinator(s) (If more than one, please specify):
Dr. Nadeem Abdalsatr Abdalrazaq (Lecturer for Theoretical Curriculum) **Email: dr.nadeem_mrmr@uruk.edu.iq** **Teaching Staff for Practical Curriculum** **Assis.lect. Tareq Talal** **Email: Tareq_sonic@yahoo.com** **Assis.lect. Fatima Salam** **Email: Fatima.99salam99@gmail.com**
8-Course Objectives:

- Knowledge of biological activities, if any. **- Predicting the biological response.** **- Knowledge of the chemistry of different groups of studied drugs, the relationship between chemical structure and biological activity of drugs.** **- Knowledge of some drug categories, including preparation procedures, identity, and testing.** **- Explaining how to avoid undesirable side effects of the studied drugs.**	**Objectives of the Course Material**
9-Teaching and Learning Strategies	
Lectures **- Oral discussions** **- Examinations** **- Reports**	**Strategy**
10-Course Structure:	

Assessmen method t	Teaching methods	Intended learning outcomes	Unit/ topic name	hours	week
Quizzes	Lectures	β-lactam antibiotics. The penicillin's, Chemical Classification, β-lactam inhibitors		3	1
Quizzes	Lectures	Cephalosporins, Monobactams. Chemical classification,SAR. Mechanism of action, Microbial resistance		3	2
		and commercial production			
Quizzes	Lectures	Amino glycosides & chloramphenicol. Chemical classification, SAR. Mechanism of action, Microbial resistance and Commercial production.		3	3
Quizzes	Lectures	Tetracyclines; macrolides Chemical classification ,SAR Mechanism of action, Microbial resistance and Commercial production		3	4
Quizzes	Lectures	Lincomycines & polypeptides. Chemical classification ,SAR Mechanism of action, Microbial resistance and Commercial production		3	5

Quizzes	Lectures	Sulfonamides; products; sulfones. SAR, Mechanism of action, Microbial resistance and commercial production		3	6
Quizzes	Lectures	Antiviral agents, The classification and biochemistry of viruses. Target for prevention of viral infection. Antiviral drugs. Chemical structures of some antiviral nucleoside and nucleotide analogs.		3	7
Mid Examination					8
Quizzes	Lectures	Anti-fungal agents, Biochemical targets for antifungal chemotherapy. Classification of antifungal drugs and SAR.		3	9
Quizzes	Lectures	Anti-neoplastic agents; alkylating agents; Introduction, drug classes, Anti metabolites Introduction, drug classes.		3	10
Quizzes	Lectures	Antibiotics; Plant products; miscellaneous compounds		3	11
Quizzes	Lectures	Plant products: Vinca Alkaloids, Hormones and their antagonists		3	12
Quizzes	Lectures	Future Anti neoplastic agents		3	13

Quizzes	Lectures	. CNS depressant; Benzodiazepines and related compounds. Analeptics, central sympathomimetic Agents, methyl xanthine. Barbiturates. Mechanism of action of Antipsychotics.		3	14
Quizzes	Lectures	onoclonal ; antibodies Gene therapy of cancer		3	15
Final exam of the semester					

11-Course Assessment

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- Sudden oral and written tests.
- Practical exams after conducting each experiment.
- Theoretical midterm exam.
- Theoretical final exam.

12- Learning and Teaching Resources: .

	Required Textbooks

1. Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry 12^{ve} ed. John M. Beale, Jr., John H. Block, 2. Faye's Principles of Medicinal Chemistry by David A. Williams and Thomas L.Lemke	**Main References (Sources):**	
• Advanced practical medicinal chemistry by Ashutosh Kar. • Lab Hand Book For Practical pharmaceutical chemistry Adopted by the Department by Assist .Prof. Karima Fadhil Ali / 2015	**a. Books and References**	
Google searching for organic Pharm chemistry	**b. Electronic References, Websites**	

1.cource cane
Industrial pharmacy
2.cource code
50303409
3.year/semester
Fourth year/ second semester
4.Date of this description
2025-02-1
5.Attendance
In-person
6.Total study hours / total unites
3 hours for theory / 2 hours for practical
7.Couce instructors
Assis. Pro. Reem AlJanabi aljanabireem@uruk.edu.iq **(theory)** **Assis. Lec. Hussein S.Janabi** saadhussein1996@gmail.com **(practical)**

8.Cource objectives	
Objectives	The objective of this course is to teach students the steps and guidelines for processing pharmaceutical dosage forms. This foundational course provides the necessary knowledge to integrate prior understanding with modern technology to formulate ideal pharmaceutical drug forms. Topics include grinding, mixing, filtration, and sterilization to ensure proper drug form processing.
9.teaching and learning strategies	
strategies	Lectures Exams Reports

	Classroom Discussions

10.cource structure

Weeks	Hours	Unit/Module Name	Learning Outcomes	Teaching Method	Assessment Method
1	3	Mixing	Introduction to mixing, mixing theory, liquid mixing, and preventing immiscibility	Lectures	Discussions
2	3	Mixing	Solid mixing, solid mixing equipment, mixing solids with liquids, solid mixing process	Lectures	Discussions
3	3	milling	Grinding theory and particle size measurement	Lectures	Discussions
4	3	Milling	Grinding equipment, its benefits, and drawbacks	Lectures	Discussions
5		Midterm Exam			Discussions
6	3	Drying	Drying theory and moisture measurement	Lectures	Discussions

7	3	Drying	Drying equipment, its benefits, and drawbacks	Lectures	Discussions
8	3	Filtration	Filtration theory, filter aids, and filtration tests	Lectures	Discussions
9	3	Filtration	Filtration equipment, membrane filtration	Lectures	Discussions
10	3	Filtration	Sterilization through filtration	Lectures	Discussions
11	3	Sterilization	Sterilization theory, sterilization rate	Lectures	Discussions
12	3	Sterilization	Sterilization equipment	Lectures	Discussions
13	3	Sterilization	Sterilization methods	Lectures	Discussions

14	3	Sterile Products	Sterile products, manufacturing sterile products	Lectures	Discussions
15	3	Sterile Products	Developing sterile products, quality control for sterile product	Lectures	Discussions
Final Exam					

11.Cource Evaluation
1.20 Mideterm 2.20 Practical 3.60 Final Exam

.12.References	
1.books	The Theory and practice of industrial pharmacy.”, Leon Lachman, 2009

2.Main References	Aulton's Pharmaceutics: The Design and Manufacture of Medicines, Third edition, Michael E. Aulton (Author). Churchill, Livingstone- Elsevier, 2014 .1 Ansel's Pharmaceutical dosage forms and drug delivery systems, tenth edition 2014
3.Resorces	
4.Online resources, websites, …….	

Cours Description

.1 Course Name
Pharmacology III
.2 Course Code:
50301406
.3 Semester / Year:
Second Semester / Fourth Stage
.4 Date of Course Description Preparation
February 1, 2025
.5 Available Attendance Mode
In-person
.6 Total Hours / Total Units:
2 hours theoretical (8 hours/week for four sections) / Total units = 3
.7 Course Coordinator Name:
Name: Dr. Hamoodi Alawi Mousa **Email: dr.hamoodialewi@uruk.edu.iq**
.8 Course Objectives
• **To enable graduating students to effectively communicate with patients and utilize all resources to interact with both patients and physicians throughout medical treatment.** • **To prepare students to educate patients on the medications they use, provide clear drug-related instructions, and overcome any barriers that hinder patient understanding.**
.9 Teaching and Learning Strategies
• **Seminars** • **Educational Labs** • **Lectures** • **Case Discussions**

Week	Hours	Topic	Chapter	Learning Method	Assessment
1	1	Hypothalamic Hormones	Pituitary and Thyroid (Ch. 23)	In-class	Quizzes & exams
2	1	Anterior Pituitary Hormones	Pituitary and Thyroid (Ch. 23)	In-class	—
3	1	Anterior Pituitary Hormones (cont.)	Pituitary and Thyroid (Ch. 23)	In-class	—
4	1	Thyroid Hormones	Pituitary and Thyroid (Ch. 23)	In-class	—
5	1	Glucocorticoids	Adrenal Hormones (Ch. 26)	In-class & Online	—
6	1	Mineralocorticoids	Adrenal Hormones (Ch. 26)	In-class	—
7	1	Diabetes Medications: Insulin	Drugs for Diabetes (Ch. 24)	In-class	—
8	1	Oral Hypoglycemics	Drugs for Diabetes (Ch. 24)	In-class	—
9	1	Drugs Affecting Bone Metabolism	Bone Metabolism (Ch. 27)	In-class	—
10	1	Estrogens	Estrogens and Androgens (Ch. 25)	In-class	—
11	1	Contraceptives	Estrogens and Androgens (Ch. 25)	In-class	—
12	1	Androgens	Estrogens and Androgens (Ch. 25)	In-class	—

11. Course Evaluation

Grades are distributed out of 100 based on various student tasks such as daily preparation, quizzes, oral and written exams, reports, etc.

12. Learning and Teaching Resources

Required Textbook

- *Lippincott® Illustrated Reviews: Pharmacology, 7th Edition*

Recommended References

- Google, ResearchGate
- Scientific journals and reports
- YouTube
- Electronic websites and platforms

Course Description Form

1. Course Name:
Communication Skills
2. Course Code:
503 05 4 11
3. Semester / Year:
4th year / 2nd Semester
4. Description Preparation Date:
February 2025
5. Available Attendance Forms:
In-Person
6. Number of Credit Hours (Total) / Number of Units (Total)
2/2
7. Course administrator's name (mention all, if more than one name)
Name: dr.Mustafa kadim Email: mustafa_kazem@uruk.edu.iq
8. Course Objectives
• **To develop students' interpersonal and professional communication skills.** • **• To teach effective verbal and non-verbal communication techniques.** • **• To improve active listening and empathy in patient interactions.** • **• To enhance confidence in delivering information clearly and respectfully.**
9. Teaching and Learning Strategies

Strategy	• Lectures with interactive exercises • Role-playing and simulations • Group discussions and presentations • Feedback and self-evaluation

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	Introduction to communication and typ	Introduction communica and types	Lecture + Discussion	Participat on

2	2	Elements of effective communication	Elements of effective communica	Lecture + Rol play	Quiz
3	2	Listening skills and barriers	Listening sk and barriers	Lecture + Practice	Assignme t
4	2	Non-verbal communication	Non-verbal communica	Lecture + Analysis	Observati n ta
5	2	Midterm Exam	Midterm Ex	—	Written E am
6	2	Communication in healthcare settings	Communica n in healthc settings	Lecture + Examples	Reflectio
7	2	Giving and receiving feedback	Giving and receiving feedback	Lecture + Workshop	Practice t st
8	2	Handling difficult conversations	Handling difficult conversatio	Lecture + Rol play	Scenario espo
9	2	Review and final presentation	Review and final presentatio	Group presentation	Oral evalu atio

11. Course Evaluation

Midterm Exam: 30%
• • Final Exam: 70%
Total: 100%

12. Learning and Teaching Resources

Required textbo (curricular books any)	Main Reference: Communication Skills for Health Professiona ls Gwen van Servellen. • Supplementary: Interpersonal Communication in Healthca e Elsevier.

Course Description Form

1. Course Name:
General toxicology
2. Course Code:
50301407
3. Semester / Year:
2nd Semester / Fourth Year
4. Description Preparation Date:
01-02-2025
5. Available Attendance Forms:
Official in-person attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
2 / 2 (2)
7. Course administrator's name (mention all, if more than one name)
Dr. Rana Jawad rana.j.h.albermani@uruk.edu.iq **Dr. Ehab Habeeb** **Dr. Abeer Mohammed** abeer.garma@uruk.edu.iq
8. Course Objectives
This course aims to provide students with a comprehensive understanding of the fundamental concepts of tox and the principles governing exposure to chemicals, xenobiotics, and environmental agents. It focuses or the s routes of entry, distribution to target tissues, and the specific mechanisms through which these substanc es exc toxic effects. Students will gain insight into the health risks associated with such exposures and the i nport identifying and implementing protective measures.
9. Teaching and Learning Strategies

Strategy	1.Clear and structured presentations to explain key topics using slides and visual aids. 2. Interactive question-and-answer sessions to review important ideas and encourage student participation. 3. Use of simple case studies to show how toxicology applies in real situations. 4. Frequent, short quizzes to help students review and remember important information.

10. Course Structure

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

1	2	Introduction , principle toxicology	Define and exp fundamental toxicolog principles, including d response relationsh types of toxic effects, factors influencing toxi	Lec.	Quizz
2	2	Target organ toxicity	Demonstrate understanding of target organ toxicity by identifying specific organs commonly affected by toxicants and explaining the reasons for their susceptibility.	Lec	Quizz
3	2	Toxic response of blood	• Recognize the structural and functional components of the blood, and describe how toxicants can alter hematologic function. Identify clinical signs laboratory find associated with toxic eff on red blood cells (anemia), white blood c (e.g., leukopenia), platelets (thrombocytopenia).	Lec	Quizz
4	2	Carcinogenetics	• Define carcinogenesis and describe the multistage process, including initiation, promotion, and progression. • Differentiate between genotoxic and non-genotoxic carcinogens, and explain their mechanisms of action at the molecular and cellular levels. • Identify common environmental, occupational, and pharmaceutical carcinogens, along with their sources and routes of exposure.	Lec	Quizz
5	2	Toxic response of liver	• Describe the anatomical and functional characteristics of the liver that make it a primary target for toxicants.	Lec	Quizz

			• Explain the processes of hepatic uptake, metabolism, and excretion of xenobiotics, including the role of phase I and phase II enzymes. • Identify major types of liver injury caused by toxicants, such as steatosis (fatty liver), necrosis, cholestasis, fibrosis, cirrhosis, and hepatocarcinogenesis. • Distinguish between zonal patterns of liver injury (e.g., centrilobular, periportal, midzonal) and relate them to the distribution of metabolic enzymes and oxygen levels.		
6	2	Toxic response of kidney	• escribe the anatomical and functional features of the kidney that contribute to its vulnerability to toxicants. • Explain the processes of renal filtration, reabsorption, secretion, and excretion relevant to xenobiotic handling in the kidney. • Identify major patterns of nephrotoxic injury, including tubular necrosis, glomerular damage, interstitial nephritis, and papillary necrosis. • Discuss the mechanisms by which toxicants cause kidney injury, such as direct cellular toxicity, oxidative stress, inflammation, and disruption of renal blood flow. • Recognize common nephrotoxic agents, including heavy metals	Lec	Quizz

			(e.g., lead, mercury), drugs (e.g., aminoglycosides, NSAIDs), and environmental chemicals		
7	2	Introduction , principle toxicology	Define and exp fundamental toxicolog principles, including d response relationsh types of toxic effects, factors influencing toxi	Lec	Quizz
8	2	Target organ toxicity	Demonstrate understanding of target organ toxicity by identifying specific organs commonly affected by toxicants and explaining the reasons for their susceptibility.	Lec	Quizz
9	2	Toxic response of blooc	• Recognize the structural and functional components of the blood, and describe how toxicants can alter hematologic function. Identify clinical signs laboratory find associated with toxic eff on red blood cells (anemia), white blood c (e.g., leukopenia), platelets (thrombocytopenia).	Lec	Quizz
10	2	Carcinogenetics	• Define carcinogenesis and describe the multistage process, including initiation, promotion, and progression. • Differentiate between genotoxic and non-genotoxic carcinogens, and explain their mechanisms of action at the molecular and cellular levels. • Identify common environmental, occupational, and pharmaceutical carcinogens, along with their sources and routes of exposure.	Lec	Quizz

11	2	Toxic response of liver	• Describe the anatomical and functional characteristics of the liver that make it a primary target for toxicants. • Explain the processes of hepatic uptake, metabolism, and excretion of xenobiotics, including the role of phase I and phase II enzymes. • Identify major types of liver injury caused by toxicants, such as steatosis (fatty liver), necrosis, cholestasis, fibrosis, cirrhosis, and hepatocarcinogenesis. • Distinguish between zonal patterns of liver injury (e.g., centrilobular, periportal, midzonal) and relate them to the distribution of metabolic enzymes and oxygen levels.	Lec	Quizz

11. Course Evaluation
Mid:20% Pra. 20% Final 60%

12. Teaching and Learning Resources

Required Textbooks

Klaassen, C.D. (Ed.). (2018). *Casarett & Doull's Toxicology: The Basic Science of Poisons* (9th ed.). McGraw-Hill Education.

Main References

Klaassen, C.D. (Ed.). (2018). *Casarett & Doull's Toxicology: The Basic Science of Poisons* (9th ed.). McGraw-Hill Education.

Cours Description

.1 Course Name
Public Health and Pharmaceutical Practice
.2 Course Code:
50304404
.3 Semester / Year:
1st Semester / Fourth Stage
.4 Date of Course Description Preparation
February 1, 2025
.5 Available Attendance Mode
In-person
.6 Total Hours / Total Units:
2 hours theoretical (8 hours/week for four sections) / Total units = 3
.7 Course Coordinator Name:
Dr. Mustafa Kazem Email: mustafa_kazem@uruk.edu.i
.8 Course Objectives
To study and understand diseases that affect human body systems, methods of diagnosis, and approaches for disease control. The course emphasizes professional pharmaceutical practices within public health contexts.
.9 Teaching and Learning Strategies
• • detailed explanation of scientific facts and information • Use of discussions and exchanges focused on relevant scientific terms and vocabulary • Use of computer-based tools, especially PowerPoint presentations, to illustrate concepts and support learning with visuals

Week	Hours	Learning Outcomes	Topic	Learning Method	Assessment
1	1	Gain basic knowledge in public health and pharmaceutical practice for professional development	Introduction to Public Health / Introduction to Pharmaceutical Practice	Scientific references, smart boards	Quizzes, assignments
2	2	Understand key concepts of pharmaceutical practice and healthcare systems	Pharmaceutical Practice / Health Systems	Same	Same
3	3	Learn disease control strategies in pharmacy practice	Epidemiology and Disease Control / Pharmacy Role	Same	Same
4	4	Understand public health awareness and community outreach	Public Health Awareness / Pharmacist's Community Role	Same	Same
5	5	Understand common communicable gastrointestinal diseases	Intro to GI Communicable Diseases in Pharmacy Practice	Same	Same
6	6	Learn control and care plans for GI infections	Pharmaceutical Planning & Care 1	Same	Same
7	7	Midterm Exam	—	—	Midterm Exam
8	8	Understand transmission and control of infectious diseases via contact surfaces	Pharmaceutical Planning & Care 2	Same	Same
9	9	Understand airborne infections and disease control	Pharmacy Management	Same	Same
10	10	Learn hospital pharmacy roles in airborne infection control	Hospital Pharmacy Practices	Same	Same
11	11	Understand zoonotic and non-communicable diseases	Veterinary and Non-Communicable Diseases (1 & 2)	Same	Same
12	12	Understand health, disease, and inheritance	Prescription Management / Regulatory Affairs 1	Same	Same

11. Course Evaluation

Mid 25%
Evaluation 5%
Final 70%

12. Learning and Teaching Resources

Required Textbook

- Lucas AO, Gilles HM (Eds), *Short Textbook of Public Health*
- *Medicine for the Tropics, 4th Edition, 2003*
- *Lilian M. Azzopardi, Lecture Notes in Pharmacy Practice, Pharmaceutical Press, 2010*
- *Main References As provided by the Ministry or department*
- *Recommended Reading Scientific journals, reports, and academic articles*
- *Electronic Resources Verified websites and online databases*

1.course name	
Industrial pharmacy II	
2.course code	
50303503	
3.year/semester	
Fifth year/ First semester	
4.Date of this description	
2025-02-1	
5.Attendance	
In-person	
6.Total study hours / total unites	
3 hours for theory / 2 hours for practical	
7.Couce instructors	
Assis. Prof. Mohammed Layth mohammad.laith.hamza@uruk.edu.iq (theory) **Assis. Pro. Reem AlJanabi aljanabireem@uruk.edu.iq (practical)** **Assis. Lec. Hussein S.Janabi saadhussein1996@gmail.com (practical)**	
8.Cource objectives	
Objectives	The objectives is to teach students the Methods for preparing various types of dosage forms, their advantages, and disadvantages. The impact of pharmaceutical additives and different dosage forms on drug product performance. Principles required for drug manufacturing and developing new formulations based on integrated knowledge of pre-

	formulation, excipients, and preparation methods for each pharmaceutical form.
9.teaching and learning strategies	
strategies	Lectures Exams Reports Classroom Discussions
10.cource structure	

Weeks	Hours	Unit/Module Name	Learning Outcomes	Teaching Method	Assessment Method
1	3	Introduction to Tablet Manufacturing	Introduction to tablet manufacturing methods	Lectures and experiments	Discussions and exams
2	3	Tablet Manufacturing	Evaluation methods for tablet manufacturing	Lectures and experiments	Discussions and exams
3	3	Tablet Evaluation	Factors affecting tablet evaluation	Lectures and experiments	Discussions and exams
4	3	Tablet Manufacturing Issues	Challenges in tablet manufacturing & solutions	Lectures and experiments	Discussions and exams

		Midterm Exam			
5	3	Tablet Coating	Tablet coating methods	Lectures and experiments	Discussions and exams
6	3	Quality Control	Quality control tests for tablets	Lectures and experiments	Discussions and exams
7	3	Hard Capsule Manufacturing	Hard capsule manufacturing methods	Lectures and experiments	Discussions and exams
8	3	Hard Capsule Evaluation	Evaluation methods for hard capsules	Lectures and experiments	Discussions and exams
9	3	Soft Capsule Manufacturing	Soft capsule manufacturing methods	Lectures and experiments	Discussions and exams
10	3	Soft Capsule Evaluation	Evaluation methods for soft capsules	Lectures and experiments	Discussions and exams

11	3	Microcapsule Manufacturing	Microcapsule manufacturing methods	Lectures and experiments	Discussions and exams
12	3	Semi-Solid Dosage Forms	Semi-solid dosage forms & absorption factors	Lectures and experiments	Discussions and exams
13	3	Semi-Solid Form Evaluation	Evaluation methods for semi-solid forms	Lectures and experiments	Discussions and exams
14	3	Aerosol Manufacturing	Aerosol manufacturing methods	Lectures and experiments	Discussions and exams
15	3	Aerosol Evaluation	Aerosol evaluation methods	Lectures and experiments	Discussions and exams
Final Exam					

11.Cource Evaluation	
1.20 Mideterm 2.20 Practical 3.60 Final Exam	
.12.References	
1.books	The Theory and practice of industrial pharmacy.”, Leon Lachman, 2009

2.Main References	Aulton's Pharmaceutics: The Design and Manufacture of Medicines, Third edition, Michael E. Aulton (Author). Churchill, Livingstone- Elsevier, 2014 .1 Ansel's Pharmaceutical dosage forms and drug delivery systems, tenth edition 2014
3.Resorces	
4.Online resources, websites, …….	

Cours Description

.1 Course Name
Applied Therapeutics I
.2 Course Code:
50305506
.3 Semester / Year:
First Semester / Fifth Stage
.4 Date of Course Description Preparation
September 2024
.5 Available Attendance Mode
In-person
.6 Total Hours / Total Units:
3 hours / 3 credit hours
.7 Course Coordinator Name:
Name: Asst. Prof. Ibrahim Adham Majid **Email: ibrahemalbayati27@gmail.com**
.8 Course Objectives
This course provides students with essential knowledge in: • **Pathophysiology, symptoms, and therapeutic goals** • **Rational use of medications, pharmacokinetics, drug interactions** • **Dosage calculations, side effects, therapeutic algorithms** • **Patient counseling and education**
.9 Teaching and Learning Strategies
· **Lectures** · **Seminars** · **Quizzes** · **Brainstorming questions**

Week	Topic	Key Learning Outcomes
1	Interpretation of Laboratory Data	Distinguish sensitivity/specificity, interpret liver/kidney tests, CBC, urinalysis, and blood diseases labs.
2	Dyslipidemia	Identify lipid disorders, statin therapy, non-statin drugs, lifestyle changes, and patient education.
3	Stroke	Differentiate types (TIA, ischemic, hemorrhagic), risk factors, treatment, and primary/secondary prevention.
4	Acute Kidney Injury	Assess renal function, treatment outcomes, and develop a therapy plan to minimize drug-induced AKI.
5	Chronic Kidney Disease	Risk factors, progression mechanisms, lifestyle/drug management, and complications of CKD.
6	Hemodialysis & Peritoneal Dialysis	Indications, procedures, complications, and comparison between methods.
7	Pharmacovigilance	Define, importance, who reports, causality assessment, terminology, and historical context.
8	Cirrhosis & Portal Hypertension	Pathophysiology, symptoms, complications, treatment goals and lifestyle recommendations.
9	Viral Hepatitis	Compare hepatitis types (A-E), transmission, lab tests, drug therapy, and chronic care plans.
10	Inflammatory Bowel Disease (IBD)	Pathophysiology, symptoms (UC vs Crohn's), drug options, monitoring, and individualized plans.
11	Shock Syndromes	Types, hemodynamic changes, fluid vs blood products, and management plans.
12	Fluid and Electrolyte Disorders	Body fluid compartments, sodium/water relationship, causes & management of electrolyte disturbances.
13	Epilepsy	Epidemiology, seizure types, treatment goals, drug and non-drug therapy, tapering plans.
14	Multiple Sclerosis	Risk factors, disease types, DMTs, symptom management, and drug monitoring.
15	Enteral Nutrition	Patient selection, components, comparison with parenteral nutrition, complications, and medication delivery.
16	Parenteral Nutrition	Indications, components, design plan, complications, refeeding syndrome, and prevention.
17	Deep Vein Thrombosis (DVT)	Risk factors, diagnosis, lab monitoring, anticoagulant options, bleeding risks, and drug-food interactions.
18	Arrhythmias	Mechanisms, types, Vaughan-Williams drug classification, treatment goals, drug comparisons, and non-drug approaches.
19	Pain Management	Pain types, assessment, drug selection, dose conversion, rescue dosing, and chronic pain strategies.
20	Headache	Types, non-drug and drug management, individualized treatment plans, and monitoring.
21	Parkinson's Disease	Neurotransmitter role, symptoms, drug therapy, non-motor management, complications, and education.

Week	Topic	Key Learning Outcomes
22	Benign Prostatic Hyperplasia (BPH)	Pathophysiology, symptoms, drug comparison (α1-blockers vs 5α-reductase inhibitors), combination therapies.
23	Glaucoma	Types (open- vs closed-angle), risk factors, pathophysiology, drug choices, monitoring, and patient counseling.

11. Course Evaluation

- Midterm Exam: 25 marks
- Attendance & Quizzes: 5 marks
- Final Exam: 70 marks

12. Learning and Teaching Resources

Required Textbooks

- *Pharmacotherapy: A Pathophysiologic Approach*
- *Pharmacotherapy: Principles and Practice*
- *Applied Therapeutics*
- *Clinical Pharmacy and Therapeutics*
- *Pharmacotherapy Handbook*
- *ACCP Updates in Therapeutics*

Recommended References

- Scientific journals
- Electronic books
- Review articles
- Online resources and websites

.1 Course Name
Clinical Chemistry
.2 Course Code:
50304505
.3 Semester / Year:
First Semester / Fifth Stage
.4 Date of Course Description Preparation
September, 2024
.5 Available Attendance Mode
In-person
.6 Total Hours / Total Units:
4 hours / 5 credit hours
.7 Course Coordinator Name:
Name: Prof. Dr. Yahya Yahya Zaki Farid Email: yahyafarid_2000@yahoo.com
.8Course Objectives
• To provide students with theoretical knowledge and technical skills in the field of clinical chemistry. • To understand the role of clinical biochemistry in normal and pathological states across body systems. • To discuss metabolic pathway alterations, their pathological causes, and how to monitor therapeutic progress. • To interpret biochemical analysis results and correlate them with clinical examinations for accurate diagnosis.
.9 Teaching and Learning Strategies
• Lectures and Presentations • Research and Inquiry • Interactive Discussions • Brainstorming

.10 Course Structure

Course Description

Week	Topic	Learning Outcomes	Hours
1–2	Carbohydrate Metabolism Disorders	Understand glucose metabolism and associated disorders	6
3	Lipid Metabolism Disorders	Recognize disorders and lab detection methods	3
4	Liver Function Tests	Understand hepatic metabolic, synthetic, and excretory functions	3
5	Kidney Function Tests I	Study renal excretory roles and waste removal mechanisms	3
6	Kidney Function Tests II	Identify acute/chronic kidney diseases and kidney stone types	3
7	**Midterm Exam**	—	—
8	Enzymes in Blood	Understand enzyme level changes in disease	3
9	Tumor Markers	Study blood biomarkers used for cancer diagnosis and monitoring	3
10	Hormonal Behavior Overview	Introduction to hypothalamus and its hormones	3
11	Pituitary Hormones	Understand disorders and lab tests	3
12	Adrenal Hormones	Study disorders and related tests	3
13	Thyroid Hormones	Identify disorders and diagnostic methods	3
14	Gonadal Hormones	Examine male/female reproductive hormones and dysfunction	3
15	Inborn Errors of Metabolism	Study lab investigations for protein, carb, and lipid metabolism disorders	3

11. Course Evaluation

- Midterm Exam: 15 marks
- Quizzes and In-class Activities: 5 marks
- Practical Assessment: 20 marks
- Final Theory Exam: 60 marks

12. Teaching and Learning Resources

Main Textbooks

- *Clinical Biochemistry & Metabolic Medicine* by Crook, 8th edition (2012)
- *Tietz Clinical Chemistry & Molecular Diagnostics*, 7th edition (2015)

Supplementary References

- *Clinical Chemistry* by Kaplan, 2012

- Scientific journals and reports
- Electronic references and websit

Course Description

1. Course Name

Pharmacoeconomics

2. Course Code:

50305513

3 . Semester / Year:

2nd semester/ 5th year students

4. Date of Course Description Preparation

1/2/2025

5. Available Attendance Mode

Class attendance (on-campus)

6. Total Hours / Total Units:

2 hours/2 Units (6 hours /week /3 groups)

7. Course Coordinator Name:

Name of the First instructor of the Course:
Dr. Gellan Alaa Mohamed, Lecturer
Degree: PhD

8. Course Objectives

- To enable the graduate student to communicate with patients and use all available means to communicate with the patient as well as with doctors during the stages of medical treatment.
- To enable the graduate student to educate patients regarding the medications they use, including the medication instructions given to them, and to overcome all difficulties and obstacles that prevent these instructions from reaching them.

9. Teaching and Learning Strategies

- Interactive lectures and related articles
- Seminars
- Hospital training
- Educational labs
- Case discussion

10. Course Structure

Week	Topic	Key Learning Outcomes	Hours
1	Basic principle of Pharmacoeconomics	1. Introduce Pharmacoeconomic principles. 2. Demonstrate types of healthcare costs with examples . 3. Learn about ECHO model for the 3 patient outcome types. 4. Explain and differentiate among the 4 methods of Pharmacoeconomic analyses.	2
2	Cost analysis	1. Identifying costs 2. Types of costs (Direct Medical Costs, Direct Nonmedical Costs, Indirect costs, Intangible costs) 3. Incremental costs and marginal costs 4. Opportunity costs 5. How are costs valued? Timing Adjustments for Costs	2
3	Cost -minimization analysis (CMA)	1. Understand the minimization effectiveness analysis 2. Outcome measures in cost-minimization analysis	2
4	Mid-term exam		
5	Cost effectiveness analyses (CEA).	1. Understand the Cost- effectiveness analysis 2. Outcome measures in cost-effectiveness analysis 3. Knowing how to calculate Cost-effectiveness Ratios	2
6	Cost-benefit analysis (CBA)	1. Understand the Cost- Benefit Analysis method. 2. Knowing how to calculate the indirect cost of the disease and indirect benefit of the intervention/program using Human Capital Method (HCM). 3. Using HCM to calculate Daily wage rate and Missed days to find out the indirect benefit of the intervention/management. 4. Describe in details Willingness-to-Pay Method (WTP): Hypothetical Scenario & Bidding Vehicles	2

Week	Topic	Key Learning Outcomes	Hours
		5. Formats for presenting Cost-Benefit Analysis (CBA) When should we select Cost-Benefit or Cost-Effectiveness Analysis?	
7	Critical assessment of economic evaluation	1. Use of decision analysis to design economic evaluations 2. Decision Analysis Structure or tree	2
8	Mid term		
9	Drug-focused versus disease-focused framework for conducting Pharmacoeconomic analyses	1. Define Cost of illness 2. Knowing how to calculate Cost of illness 3. Understand the difference between healthcare costs and Cost of illness	2
10	Introduction to Epidemiology	1. Define epidemiology, describe basic terminology and concepts of epidemiology. 2. Identify types of data sources. 3. Identify basic methods of data collection and interpretation.	2
11	Project presentation.	Cost-Effectiveness project can be assigned to teach students how to understand erminologies used in published Pharmacoeconomic studies.	2
12	Project presentation.	Cost-Effectiveness project can be assigned to teach students how to understand terminologies used in published Pharmacoeconomic studies.	2

11. Course evaluation

Mid-term 30 marks, final exam 70 marks

12. Teaching and Learning Resources

Required Textbooks

Bootman JL, Townsend RJ, McGhan WF, (Eds.), Principles Pharmacoeconomics, 2nd ed., Harvey Whitney Books Compa Cincinnati, Oh, latest edition
Renée J.G. Arnold. Pharmacoeconomics From Theory to Practice. Second Edition, 2021. CRC Press,

Boca Raton, FL, USA

Main References

Hasan Raid, Ali Azeez Al-Jumaili, Nizar Abdulateef Al Ani. Refere Infliximab (Remicade) compared to its biosimilar (Remsima) in patie with Ankylosing spondylitis: A Field-based Pharmacoeconomic study.
Kindy College Medical Journal. April 30, 2023:19
https://doi.org/10.47723/kcmj.v19i1.908

Hasan Raid Fadhil, Ali Azeez Al-Jumaili, and Nizar Abdulateef Al Cost-effectiveness Analysis of Reference Infliximab (Remica Compared to its Biosimilar (Remsima) in Iraqi Patients with Rheumat Arthritis. Iraqi J Pharm Sci, Vol.31(Suppl.) 20
https://doi.org/10.31351/vol31issSuppl.pp100-110

Recommended Readings

Value in Health Journal
Value in Health | Journal | ScienceDirect.com by Elsevier
Value in Health Journal Regional Issues
https://www.valuehealthregionalissues.com/

Course Description

.1 Course Name
Applied Therapeutics II
.2 Course Code:
50305511
.3 Semester / Year:
Second Semester / Fifth Stage
.4 Date of Course Description Preparation
February 2025
.5 Available Attendance Mode
In-person
.6 Total Hours / Total Units:
2 hours / 2 credit hours
.7 Course Coordinator Name:
Name: Asst. Prof. Ibrahim Adham Majid Email: ibrahemalbayati27@gmail.com
.8Course Objectives
• Provide students with foundational knowledge of the pathophysiology, symptoms, and therapeutic goals for selected conditions including cancers, endocrine, gynecological, psychiatric, and neurological disorders. • Equip students with understanding of drug use, dosage considerations, side effects, treatment algorithms, and therapeutic outcome evaluation for the mentioned disorders.
.9 Teaching and Learning Strategies
· Lectures · Seminars · Quizzes · Brainstorming questions
.10 Course Structure

Week	Topic	Learning Outcomes	Hours
1	Adrenal Gland Disorders	Hormonal roles, Addison's disease, Cushing's syndrome management & monitoring	1
2	Thyroid Disorders	HPT axis, hypothyroidism, hyperthyroidism, LT4 therapy, pregnancy, and monitoring	2
3	Alzheimer's Disease	Pathophysiology, symptoms, combined therapies, and patient/caregiver education	1
4	Schizophrenia	Symptoms, mechanisms, antipsychotic selection, side effects, and family counseling	2
5	Depression	Etiology, diagnosis, drug therapy, monitoring, and patient counseling	2
6	Anxiety Disorders	Pathophysiology, symptoms, drug and lifestyle therapy, and individualized plans	1
7	Insomnia	Mechanisms, non-drug & drug treatments, and safety monitoring	1
8	Contraception	Physiology, hormonal methods, risks, drug interactions, patient education	1
9	Menopause & HRT	Physiologic changes, therapy goals, evaluation, and therapy planning	2
10	Menstrual Disorders	Causes, symptoms, therapy goals, and treatment plan for dysmenorrhea & ovulatory bleeding	1
11	Chemotherapy & Cancer	Cancer stages, treatment strategies, and medication safety measures	2
12	Leukemia	Pathophysiology, labs, chemotherapy protocols, and side effect management	2

Week	Topic	Learning Outcomes	Hours
13	Breast Cancer	Risk factors, prognosis markers (HER2, PD-1), stages, and therapy options	1
14	Prostate Cancer	Risk factors, treatment options, ADT effects, metastatic disease, and bone health	1
15	Chemotherapy Side Effects	Overview, clinically significant effects, prevention, and treatment options	1
16	Bipolar Disorder	Phases, drug selection, monitoring, pediatric considerations, and therapy goals	2
17	Colorectal Cancer	Risk factors, screening, symptoms, stage-based therapy, and patient education	1
18	HIV	Transmission, symptoms, ART therapy, goals, monitoring, and lifestyle advice	2
19	Lymphomas & Myeloma	Types, staging, prognostic systems, therapies, and monoclonal antibody use	2
20	Endometriosis	Pathophysiology, symptoms, and general treatment approaches	1

11. Course Evaluation

- Midterm Exam: 25 marks
- Attendance & Quizzes: 5 marks
- Final Exam: 70 marks

12. Teaching and Learning Resources

Required Textbooks

- *Pharmacotherapy Handbook*
- *Applied Therapeutics*
- *ACCP Updates in Therapeutics*

Recommended Resources

- Review articles
- Medscape
- Scientific journals and online medical databases

.1 Course Name
Advance pharmaceutical analysis
.2 Course Code:
50302504
.3 Semester / Year:
Second course / 2024-2025
.4 Date of Course Description Preparation
2/2025
.5 Available Attendance Mode
Real attendance
.6 Total Hours / Total Units:
3 hr weekly theoretical, 2hr practical
.7 Course Coordinator Name:
Lecturer : Rafid M. Hashim **Lab. Staff:** **Assistance lecturer: Zahraa saadi Email: Zahriasaadi92@gmail.com** **Assistance lecturer: Zahraa mukhtar**
.8 Course Objectives
To study spectrometric methods used for identification and characterization of organic compoun including UV, IR, MASS and NMR spectroscopy; it enables students to understand the applications of these techniques for qualitative and quantitative analysis of organic compounds
.9 Teaching and Learning Strategies
• Lectures • Laboratory • Seminars • Application of analysis

.10 Course Structure

Course Description

Week	Topic	Key Learning Outcomes	Hours
1	UV- spectroscopy	Lectures , discussion, quizez	3
2	UV- spectroscopy	Lectures , discussion, quizez	3
3	IR- spectroscopy	Lectures , discussion, quizez	3
4	IR- spectroscopy	Lectures , discussion, quizez	3
5	IR- spectroscopy	Lectures , discussion, quizez	3
6	NMR- spectroscopy	Lectures , discussion, quizez	3
7	NMR- spectroscopy	Lectures , discussion, quizez	3
8	NMR- spectroscopy	Lectures , discussion, quizez	3
9	NMR- spectroscopy	Lectures , discussion, quizez	33
10	NMR- spectroscopy	Lectures , discussion, quizez	3

Week	Topic	Key Learning Outcomes	Hours
11	CNMR- spectroscopy	Lectures , discussion, quizez	3
12	Mass- spectrometry	Lectures , discussion, quizez	3
13	Mass- spectrometry	Lectures , discussion, quizez	3
14	Mass- spectrometry	Lectures , discussion, quizez	3
15	Mass- spectrometry	Lectures , discussion, quizez	3

12. Teaching and Learning Resources

Required Textbooks Moder n Pharmaceutical Drug Analysis, by L. Zechmeister And L. Von Cholnoky, ISBN (13) : 978-81-224-2718-9

Pharmaceutical Analysis Edited by DAVID C. LEE GlaxoSmithKline Stevenage, UK and

MICHAEL L. WEBB GlaxoSmithKline Stevenage, UK.

Lab manual of advance pharmaceutical analysis

.1 Course Name
Lab Training
.2 Course Code:
50304504
.3 Semester / Year:
First & Second / Fifth
.4 Date of Course Description Preparation
7/5/2025
.5 Available Attendance Mode
In- person Attendance
.6 Total Hours / Total Units:
4/2
.7 Course Coordinator Name:
م.م. سرى عبد الكريم م.م. رؤى محمد م.د.لمياء عادل
.8Course Objectives
• Providing the student with the necessary technical skills and principles of laboratory testing in the field of clinical biochemistry, serums, hematology and microbiology • Clarify the scope of available laboratory technologies in addition to the advantages and disadvantages of each. • Linking laboratory results with clinical examination to reach an accurate diagnosis and follow-up response to treatment.
.9 Teaching and Learning Strategies
• Practical training in specialized laboratories • Interactive discussions •Brainstorming • Research and induction

.10 Course Structure

Course Description

Week	Topic	Key Learning Outcomes	Hours
1	Diagnostic test basics, collecting &transporting specimens,venipuncture, urine specimen, stool specimen.	Sample collection	4
2	Biochemical tests: Fasting blood glucose, Post-prandial glucose, Oralglucose tolerance test.	Glucose test	4
3	Blood urea, Blood creatinine, Creatinine clearance, Uric acid.	Kidney function test	4
4	Cholesterol, Lipoproteins, triglycerides.	Lipid profile	4
5	Blood proteins, Bilirubin.	Serum protein	4
6	Calcium, Inorganic phosphate, Serum chloride	electrolytes	4
7	Alkaline phosphatase, Acid phosphatase, Alanine amiotransferase,Aspartate aminotransferase, Lactate dehydrogenase, Creatine phosphokinase.	Enzymes	4
8	Serological tests: VDRL, ASO- Titer, Hepatitis tests.	Seriology	4
9	C-reactive protein test, Rheumatic factor test, Rosebengal test, Typhoid fever test(Widal test), Pregnancy Test.	Inflammatory markers	4

Week	Topic	Key Learning Outcomes	Hours
10	General urine examination, urine specimen collection.	Urine test	4
11	Hematological tests: RBC count, Hb, PCV, RBC indices, WBC count, Platelets count.	Blood test	4
12	Blood typing, Coombs test, Bleeding time, ESR.	Blood test	4
13	Microbiological tests: culture and sensitivity tests, Staining methods	Microbiology	4
14	Culture media, Enriched culture media for general use	Microbiology	4
15	Tests for identification of bacteria, Disk diffusion tests of sensitivityto antibiotics, Choice of drugs for disk test, bacterial disease and theirlaboratory diagnosis.	Microbiology	4

12. Teaching and Learning Resources

Required Textbooks

Laboratory training booklet (prepared by members of the clinical laboratory science department)

Main References

Henry's Clinical Diagnosis and Management by Laboratory Methods. 24th ed.; 2021. –

Clinical Laboratory Methods: Atlas of Commonly Performed Tests. 2022.

Recommended Readings

1.course name
Hospital Training
2.course code
503 05 5 10
3.year/semester
Second Semester / Fifth Stage
4.Date of this description
2025-02-1
5.Attendance
Full-time
6.Total study hours / total unites
6 Hours
7.Couce instructors

Dr. Ibraheem adhem
Dr. Yahya Ghanem Hussein
Dr.alyaa hussien
Dr.mustafa kadim
Dr.mazen abdulrida

ibrahemalbayati27@gmail.com
yahyaghanem@uruk.edu.iq
alyaahussein@uruk.edu.iq
mustafa_kazem@uruk.edu.iq
mazenabdulrida@gmail.com

8.Cource objectives	
Objectives	Teach students how to apply pharmacy practice in hospital wards. Cover various hospitals, including: Evaluating and monitoring patient cases.

	Assessing treatment systems and recording therapy-related errors. Providing solutions to problems related to drug therapy.
9.teaching and learning strategies	
strategies	Lectures Exams Reports Classroom discussions Hospital training
10.cource structure	

Weeks	Hours	Unit/Module Name	Learning Outcomes	Teaching Method	Assessment Method
1	10	Internal Medicine	Cardiovascular diseases, respiratory diseases, kidney diseases, stomach diseases, diabetes and its complications	Lectures and experiments	Discussions and exams
2	5	Surgery	Pre- and post-operative care, anesthesia, nutrition, hernias, appendicitis, diabetic foot, breast cancer, kidney stones	Lectures and experiments	Discussions and exams
3	5	Gynecology	Miscarriage, diabetes and hypertension during pregnancy, anemia, urinary	Lectures and experiments	Discussions and exams

			tract infections during pregnancy, PCOS, endometrial thickening		
4	10	Pediatric	Acute respiratory distress, seizures, fever, jaundice and its complications, digestive and nervous system diseases	Lectures and experiments	Discussions and exams
Final Exam					

11.Cource Evaluation

1. Mideterm 40
2. Final exam 60

.12.References

1.books	Barbara G. Wells & Joseph T. DiPiro, *Pharmacotherapy Handbook*, 7th Edition.
2.Main References	
3.Resorces	**Internet**
4.Online resources, websites, …….	

Course Description

.1 Course Name
Pharmaceutical chemistry 4
.2 Course Code:
50302502
.3 Semester / Year:
first course / 2024-2025
.4 Date of Course Description Preparation
2/2025
.5 Available Attendance Mode
Real attendance
.6 Total Hours / Total Units:
2 hr weekly theoretical
.7 Course Coordinator Name:
Lecturer : Rafid M. Hashim
.8 Course Objectives
To study the concept of prodrug and its importance to overcome the challenges in pharmacokinetics and other properties of drug
.9 Teaching and Learning Strategies
• Lectures • Laboratory • Seminars • Application of analysis
.10 Course Structure

Week	Topic	Key Learning Outcomes	Hours
1	Prodrug - introduction	Lectures , discussion, quizez	2
2	prodrug- functional group	Lectures , discussion, quizez	2
3	prodrug - amines	Lectures , discussion, quizez	2
4	prodrug - bioprecursor	Lectures , discussion, quizez	2
5	prodrug – Ch. Delivery system	Lectures , discussion, quizez	2
6	prodrug – POLYMERIC PRODRUG	Lectures , discussion, quizez	2
7	Combinatorial chemistry	Lectures , discussion, quizez	2
8	Peptides and peptoids	Lectures , discussion, quizez	2
9	polymers	Lectures , discussion, quizez	2
10	mass- spectroscopy	Lectures , discussion, quizez	2
11	CNMR- spectroscopy	Lectures , discussion, quizez	3

Week	Topic	Key Learning Outcomes	Hours
12	Mass- spectrometry	Lectures , discussion, quizez	3
13	Mass- spectrometry	Lectures , discussion, quizez	3
14	Mass- spectrometry	Lectures , discussion, quizez	3
15	Mass- spectrometry	Lectures , discussion, quizez	3

12. Teaching and Learning Resources

Wilson and gisvold textbook of organic medicinal and pharmaceutical chemistry :

Delgado , JN, remers WA, (Eds);10thed, 2004

P John McCurry;organic chemistry ;Thomason learningInc, ; CA,USA7thed 2011

.1 Course Name
Advance pharmaceutical analysis
.2 Course Code:
50302504
.3 Semester / Year:
Second course / 2024-2025
.4 Date of Course Description Preparation
2/2025
.5 Available Attendance Mode
Real attendance
.6 Total Hours / Total Units:
3 hr weekly theoretical, 2hr practical
.7 Course Coordinator Name:
Lecturer : Rafid M. Hashim **Lab. Staff:** **Assistance lecturer: Zahraa saadi Email: Zahriasaadi92@gmail.com** **Assistance lecturer: Zahraa mukhtar**
.8 Course Objectives
To study spectrometric methods used for identification and characterization of organic compoun including UV, IR, MASS and NMR spectroscopy; it enables students to understand the applications of these techniques for qualitative and quantitative analysis of organic compounds
.9 Teaching and Learning Strategies
• Lectures • Laboratory • Seminars • Application of analysis

.10 Course Structure

Course Description

Week	Topic	Key Learning Outcomes	Hours
1	UV- spectroscopy	Lectures , discussion, quizez	3
2	UV- spectroscopy	Lectures , discussion, quizez	3
3	IR- spectroscopy	Lectures , discussion, quizez	3
4	IR- spectroscopy	Lectures , discussion, quizez	3
5	IR- spectroscopy	Lectures , discussion, quizez	3
6	NMR- spectroscopy	Lectures , discussion, quizez	3
7	NMR- spectroscopy	Lectures , discussion, quizez	3
8	NMR- spectroscopy	Lectures , discussion, quizez	3
9	NMR- spectroscopy	Lectures , discussion, quizez	33
10	NMR- spectroscopy	Lectures , discussion, quizez	3

Week	Topic	Key Learning Outcomes	Hours
11	CNMR- spectroscopy	Lectures , discussion, quizez	3
12	Mass- spectrometry	Lectures , discussion, quizez	3
13	Mass- spectrometry	Lectures , discussion, quizez	3
14	Mass- spectrometry	Lectures , discussion, quizez	3
15	Mass- spectrometry	Lectures , discussion, quizez	3

12. Teaching and Learning Resources

Required Textbooks Moder n Pharmaceutical Drug Analysis, by L. Zechmeister And L. Von Cholnoky, ISBN (13) : 978-81-224-2718-9

Pharmaceutical Analysis Edited by DAVID C. LEE GlaxoSmithKline Stevenage, UK and

MICHAEL L. WEBB GlaxoSmithKline Stevenage, UK.

Lab manual of advance pharmaceutical analysis

Cours Description

.1 Course Name
Clinical Toxicology
.2 Course Code:
50301501
.3 Semester / Year:
First Semester / Fifth Stage
.4 Date of Course Description Preparation
February 1, 2025
.5 Available Attendance Mode
In-person
.6 Total Hours / Total Units:
2 / 2 hours / Total units = 2
.7 Course Coordinator Name:
Dr. Reem Ghanim Hussein **Email:** Reemghanem@uruk.edu.iq Lab. staff 1. Ehab Habib ph.ehabhabeeb@gmail.com 2. Abeer Mohammed abeer.garma@uruk.edu.iq
.8 Course Objectives
1. • Enabling students to identify some cases of poisoning 2. - Enabling students to acquire the skills to use scientific research tools in the academic and practical fields 3. Enabling students to possess dialogue and discussion skills - Enabling students to possess self-learning skills
.9 Teaching and Learning Strategies
• · Lectures · Seminars · Quizzes · Brainstorming questions

Week	Hours	Learning Outcomes	Topic	Learning Method	Assessment
1	3	Poisoning and the mechanism of its occurrence	Laboratory Principles or Toxicological Screening.	Lecture + Educational slides	Weekly quizzes + oral exams
2	3	Knowing about how Poisoning in children and adults occur	Poisoning in children and adults	Lecture + Educational slides	Weekly quizzes + oral exams
3	3	Knowledge with caffeine poisoning, decongestant, and antihistamines. And theophylline	Poisoning with an OTC drug	Lecture + Educational slides	Weekly quizzes + oral exams
4	3	Knowledge with anti-inflammatory vitamin and steroid poisoning	Poisoning with an OTC drug	Lecture + Educational slides	Weekly quizzes + oral exams
5	3	Knowledge with the toxicity of beta blockers and angiotensin converting enzyme (ACE) inhibitors	Medical prescriptions	Lecture + Educational slides	Weekly quizzes + oral exams
6	3	Knowledge with the toxicity of Cardiac glycosides toxicity: Digitalis, Ca Channal Blockers	Medical prescriptions	Lecture + Educational slides	Weekly quizzes + oral exams
7	3	Knowledge with the toxicity of antiarrhythmic and hypoglycemic medications	Medical prescriptions	Lecture + Educational slides	Weekly quizzes + oral exams
8	3	Knowledge with the toxicity of Opioid toxicity	Medical prescriptions	Lecture + Educational slides	Weekly quizzes + oral exams
9	3	Knowledge with the toxicity of TCA	Medical prescriptions	Lecture + Educational slides	Weekly quizzes + oral exams
10	3	Familiarity with phenothiazine toxicity	Medical prescriptions	Lecture + Educational slides	Weekly quizzes + oral exams
11	3	CNS stimulants	Medical prescriptions	Lecture + Educational slides	Weekly quizzes + oral exams
12	3	Knowledge the toxicity of with the toxicity of cocaine, opioid, phencyclidine, and acid Lysergic and marijuana	Medical prescriptions	Lecture + Educational slides	Weekly quizzes + oral exams
13	3	Familiarity with the toxicity of household disinfectants and camphor	Drug abuse	Lecture + Educational slides	Weekly quizzes + oral exams
14	3	Knowledge the toxicity of Environmental chemicals and toxins	Environmental chemicals and toxins	Lecture + Educational slides	Weekly quizzes + oral exams
15	3	Knowledge the toxicity of Plants and derived toxins	Plants and derived toxins	Lecture + Educational slides	Weekly quizzes + oral exams

11. Course Evaluation

- Midterm Exam: 15 marks
- Attendance & Quizzes: 5 marks
- Final Exam: 60 marks

12. Learning and Teaching Resources

Required Textbook

- **Prescribed Textbook (if available):**
  Gossel TA, Bricker TD, (EDS.); Principles of clinical toxicology;8thed,2015.
- ***Viccellio P, (ED.); Handbook of medical toxicology; lasts edition.***
-
- ***Required TextbooksRecommended Resources***
- *1-Researchgate.com*
- *2-Googlescholar.com*
- *3- Review articles*
- *Medscape*
- *Scientific journals and online medical databases*
- *Youtube.com*
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Cours Description

.1 Course Name
Pharmaceutical Dosage Form Design
.2 Course Code:
50303508
.3 Semester / Year:
Second Semester – Fifth Year
.4 Date of Course Description Preparation
May 5, 2025
.5 Available Attendance Mode
In-person
.6 Total Hours / Total Units:
2 hours / Total units = 2
.7 Course Coordinator Name:
Dr. Ghasak Kais Abd-AL Hussain, ghasakqais69@gmail
.8 Course Objectives

1. 1. To introduce students to the process of drug discovery, sources, methods of extraction, development, determination of efficacy and safety for human use, and registration stages in accordance with international drug regulatory bodies such as the FDA.
2. 2. To familiarize students with FDA regulations on pharmaceutical manufacturing registration and Good Manufacturing Practice (GMP) certification.
3. 3. To introduce students to different types of pharmaceutical packaging, materials used, their interactions with drug products, susceptibility to environmental factors, transport logistics, and cost implications.
4. 4. To review the physical and chemical properties of drug substances and their impact on pharmacological efficacy. To explore strategies for modifying these properties to enhance therapeutic effect, reduce side effects, and improve safety.
5. 5. To study bioavailability and bioequivalence, methods of calculation, and comparison of multiple formulations and brands against reference (originator) products.
6. 6. To study stability throughout all development stages and how it determines shelf-life and expiry date of the product.
7. 7. To study labeling requirements for pharmaceutical, herbal, and over-the-counter (OTC) products, including mandatory elements on the outer package, immediate container label, and package insert.
8. 8. To study excipients of various types, their roles, proportions, and mixing techniques with the active pharmaceutical ingredient (API) to enhance effectiveness, patient acceptability, and age-specific suitability.

.9 Teaching and Learning Strategies

- ・Lectures
- Oral discussions

- Quizzes and exams

- Reinforcement through discussions and memorization

- Electronic exams and e-learning participation

Week	Hours	Learning Outcomes	Topic	Learning Method	Assessment
1	3	Laboratory Principles or Toxicological Screening.	Laboratory Principles or Toxicological Screening.	Lecture + Educational slides	Weekly quizzes + oral exams
2	3	Drug compounding and pharmaceutical dosage form modifications, and their impact on patient outcomes	Drug compounding and pharmaceutical dosage form modifications, and their impact on patient outcomes	Lecture + Educational slides	Weekly quizzes + oral exams
3	3	Development of new drugs and stages of drug approval	Development of new drugs and stages of drug approval	Lecture + Educational slides	Weekly quizzes + oral exams
4	3	Definition of the drug under Food and Drug Administration (FDA) terms, and access to reliable drug information sources	Definition of the drug under Food and Drug Administration (FDA) terms, and access to reliable drug information sources	Lecture + Educational slides	Weekly quizzes + oral exams
5	3	Practicing modern pharmaceutical manufacturing and advanced production processes	Practicing modern pharmaceutical manufacturing and advanced production processes	Lecture + Educational slides	Weekly quizzes + oral exams
6	3	Practice in novel pharmaceutical formulations	Practice in novel pharmaceutical formulations	Lecture + Educational slides	Weekly quizzes + oral exams
7	3	Pharmaceutical dosage design: principles and pharmaceutical calculation	Pharmaceutical dosage design: principles and pharmaceutical calculation	Lecture + Educational slides	Weekly quizzes + oral exams
8	3	Pharmaceutical calculations related to physicochemical properties	Pharmaceutical calculations related to physicochemical properties	Lecture + Educational slides	Weekly quizzes + oral exams
9	3	Continuation of pharmaceutical calculations and physicochemical applications	Continuation of pharmaceutical calculations and physicochemical applications	Lecture + Educational slides	Weekly quizzes + oral exams
10	3	Dosage form scaling and adjustment of therapeutic drug doses	Dosage form scaling and adjustment of therapeutic drug doses	Lecture + Educational slides	Weekly quizzes + oral exams

Week	Hours	Learning Outcomes	Topic	Learning Method	Assessment
11	3	Continuation of dosage form scaling and dose adjustment principles	Continuation of dosage form scaling and dose adjustment principles	Lecture + Educational slides	Weekly quizzes + oral exams
12	3	Final stage of dosage form scaling and overview of excipients, solvents, and stabilizing agents	Final stage of dosage form scaling and overview of excipients, solvents, and stabilizing agents	Lecture + Educational slides	Weekly quizzes + oral exams
13	3	Biopharmaceutical considerations – drug distribution and its influencing factors	Biopharmaceutical considerations – drug distribution and its influencing factors	Lecture + Educational slides	Weekly quizzes + oral exams
14	3	Pharmaceutical equivalence and bioequivalence, and comparison of different drug dosages in terms of bioavailability	Pharmaceutical equivalence and bioequivalence, and comparison of different drug dosages in terms of bioavailability	Lecture + Educational slides	Weekly quizzes + oral exams

11. Course Evaluation

- Midterm Exam:25 marks
- Attendance & Quizzes: 5 marks
- Final Exam: 70 marks

12. Learning and Teaching Resources

Required Textbook

- **Prescribed Textbook (if available):**
  Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems

Cours Description

.1 Course Name
Pharmaceutical Biotechnology
.2 Course Code:
50303507
.3 Semester / Year:
Second Semester – Fifth Year
.4 Date of Course Description Preparation
May 5, 2025
.5 Available Attendance Mode
In-person
.6 Total Hours / Total Units:
1 hours / Total units = 2
.7 Course Coordinator Name:
Ms. Hala Sadiq Yousif hala_sadiq@uruk.edu.iq
.8 Course Objectives
1. By the end of the semester, students are expected to learn: 2. - Information about biotechnological products such as proteins. 3. - Basic principles of formulating and preparing biotech and biopharmaceutical products. 4. - Ability to formulate therapeutic proteins. 5. - Information on freeze-drying and excipients used in protein formulation with this technique. 6. - Information on protein delivery routes, both traditional and alternative. 7. - Information on protein pharmacokinetics including absorption, distribution, and elimination.
.9 Teaching and Learning Strategies
• Use of various teaching methods (lectures, discussions, inquiry, brainstorming). - Various demonstrations and practices to enrich the class (scientific videos, interactive boards, diagrams). - Uploading lectures and academic activities to the university's official academic website. - Lectures delivered through academic electronic platforms (Google Classroom, free group calls). - Communication with students via multiple scientific and social platforms including Google Classroom, Facebook, Viber, and WhatsApp. - Two midterm exams will be held; the best two of three will be considered. No make-up exams; missing two will result in a zero. - Attendance is mandatory. University rules will apply to absentees without valid reasons. - All cheating incidents will be reported. Cheating includes submitting copied or others' work, impersonation, etc.

Week	Hours	Learning Outcomes	Topic	Learning Method	Assessment
1	1	Biotechnology, Molecular Biotechnology, Biotech Drugs, Biotech Pharmaceutical Products | Introduction to Biotechnology	Biotechnology, Molecular Biotechnology, Biotech Drugs, Biotech Pharmaceutical Products | Introduction to Biotechnology	Lecture + Educational slides	Weekly quizzes + oral exams
2	1	Microbial considerations, Sterilization, Pyrogen removal, Viral contamination | Formulation of Biotech Products	Microbial considerations, Sterilization, Pyrogen removal, Viral contamination | Formulation of Biotech Products	Lecture + Educational slides	Weekly quizzes + oral exams
3	1	Components in IV formulations of genetically engineered products, Solubility enhancers, Anti-adsorption agents | IV product excipients, Solubility enhancers, Anti-adsorption agents	Components in IV formulations of genetically engineered products, Solubility enhancers, Anti-adsorption agents | IV product excipients, Solubility enhancers, Anti-adsorption agents	Lecture + Educational slides	Weekly quizzes + oral exams
4	1	Buffer components, Preservatives, Antioxidants, Cryoprotectants, Freeze-drying of proteins | Buffers, Preservatives, Cryoprotectants	Buffer components, Preservatives, Antioxidants, Cryoprotectants, Freeze-drying of proteins | Buffers, Preservatives, Cryoprotectants	Lecture + Educational slides	Weekly quizzes + oral exams
5	1	| IV administration methods | Protein Delivery and Administration Routes	| IV administration methods | Protein Delivery and Administration Routes	Lecture + Educational slides	Weekly quizzes + oral exams
6	1	Alternative administration methods | Oral, Nasal, Pulmonary, Transdermal, and Rectal routes	Alternative administration methods | Oral, Nasal, Pulmonary, Transdermal, and Rectal routes	Lecture + Educational slides	Weekly quizzes + oral exams
7	1	Oral administration | Development and improvement of oral therapy delivery |	Oral administration | Development and improvement of oral therapy delivery |	Lecture + Educational slides	Weekly quizzes + oral exams
8	1	Vaccine production | Vaccine production using biotechnological methods	Vaccine production | Vaccine production using biotechnological methods	Lecture + Educational slides	Weekly quizzes + oral exams
9	1	Insulin production | Insulin production via	Continuation of pInsulin production | Insulin	Lecture + Educational slides	Weekly quizzes + oral exams

Week	Hours	Learning Outcomes	Topic	Learning Method	Assessment
		biotechnological techniques	production via biotechnological techniques harmaceutical calculations and physicochemical applications		
10	1	Pharmacokinetics and pharmacodynamics of peptide and protein drugs | Protein therapeutics PK, absorption, strategies for overcoming oral delivery barriers	DPharmacokinetics and pharmacodynamics of peptide and protein drugs | Protein therapeutics PK, absorption, strategies for overcoming oral delivery barriers osage form scaling and adjustment of therapeutic drug doses	Lecture + Educational slides	Weekly quizzes + oral exams
11	1	Distribution of therapeutic proteins | Mechanisms of distribution and volume of distribution, receptor-mediated transport	Distribution of therapeutic proteins | Mechanisms of distribution and volume of distribution, receptor-mediated transport	Lecture + Educational slides	Weekly quizzes + oral exams
12	1	Proteolytic degradation, elimination of protein therapies | Protein metabolism in the digestive system	Proteolytic degradation, elimination of protein therapies | Protein metabolism in the digestive system	Lecture + Educational slides	Weekly quizzes + oral exams
13	1	Renal metabolism of proteins and excretion processes | Glomerular filtration, tubular reabsorption, post-filtration reabsorption	Renal metabolism of proteins and excretion processes | Glomerular filtration, tubular reabsorption, post-filtration reabsorption	Lecture + Educational slides	Weekly quizzes + oral exams
14	1	Receptor-mediated endocytosis, direct shuttle transport, metabolic receptors | Protein metabolism in the liver	Receptor-mediated endocytosis, direct shuttle transport, metabolic receptors | Protein metabolism in the liver	Lecture + Educational slides	Weekly quizzes + oral exams

11. Course Evaluation

- Midterm Exam:25 marks
- Attendance & Quizzes: 5 marks
- Final Exam: 70 marks

Cours Description

.1 Course Name

Therapy Drug Monitoring

.2 Course Code:

512 05 503

.3 Semester / Year:

Second Semester – Fifth Year

.4 Date of Course Description Preparation

May 5, 2025

.5 Available Attendance Mode

In-person

.6 Total Hours / Total Units:

2 / 2 hours / Total units = 2

.7 Course Coordinator Name:

Lecture : Dr. Yahya Ghanem Hussein (yahyaghanem@uruk.edu.iq)

Teaching Staff for Practical Curriculum:

Dr. Alia Hussein Hammadi (alyaahussein@uruk.edu.iq)

.8 Course Objectives

1. * To make the graduating student capable of communicating with patients and using all available means to communicate with the patient as well as with doctors during the stages of medical treatment.
2. * To make the graduating student capable of educating patients regarding the medications used by them, including the drug instructions given to them, and overcoming all difficulties and obstacles that hinder the delivery of these instructions to them.

.9 Teaching and Learning Strategies

Seminars

* Educational laboratories

* Hospital training

* Lectures

Week	Hours	Learning Outcomes	Topic	Learning Method	Assessment
1	1	Review of basic pharmacokinetic (PK) and pharmacodynamic (PD)	Review of basic pharmacokinetic (PK) and pharmacodynamic (PD)	Lecture + Educational slides	Weekly quizzes + oral exams
2	1	Clinical PK equations and calculations	Clinical PK equations and calculations	Lecture + Educational slides	Weekly quizzes + oral exams
3	1	Clinical PK in special population and cases	Clinical PK in special population and cases	Lecture + Educational slides	Weekly quizzes + oral exams
4	1	Clinical PK/PD for Aminoglycosides	Clinical PK/PD for Aminoglycosides	Lecture + Educational slides	Weekly quizzes + oral exams
5	1	Clinical PK/PD for Vancomycin	Clinical PK/PD for Vancomycin	Lecture + Educational slides	Weekly quizzes + oral exams
6	1	Clinical PK/PD for Digoxin	Clinical PK/PD for Digoxin	Lecture + Educational slides	Weekly quizzes + oral exams
7	1	Clinical PK/PD for Phenytoin	Clinical PK/PD for Phenytoin	Lecture + Educational slides	Weekly quizzes + oral exams
8	1	Vaccine production | Vaccine production using biotechnological methods	Vaccine production | Vaccine production using biotechnological methods	Lecture + Educational slides	Weekly quizzes + oral exams
9	1	Clinical PK/PD for other Anticonvulsants (e.g., Carbamazepine, Valproic Acid, Phenobarbitone/Primidone, Ethosuxsimide	Clinical PK/PD for other Anticonvulsants (e.g., Carbamazepine, Valproic Acid, Phenobarbitone/Primidone, Ethosuxsimide	Lecture + Educational slides	Weekly quizzes + oral exams
10	1	Clinical PK/PD for Theophylline	Clinical PK/PD for Theophylline	Lecture + Educational slides	Weekly quizzes + oral exams
11	1	Clinical PK/PD for Immunossprasants (e.g., Cyclosporine, Tacrolimus	Clinical PK/PD for Immunossprasants (e.g., Cyclosporine, Tacrolimus	Lecture + Educational slides	Weekly quizzes + oral exams
12	1	Clinical PK/PD for other Cardiovascular agents (e.g., Lidocaine, Procainamide/N-Acetyl Procainamide	Clinical PK/PD for other Cardiovascular agents (e.g., Lidocaine, Procainamide/N-Acetyl Procainamide	Lecture + Educational slides	Weekly quizzes + oral exams
13	1	Clinical PK/PD of other drugs (e.g., Lithium), Anticancer agents,	Clinical PK/PD of other drugs (e.g., Lithium), Anticancer agents,	Lecture + Educational slides	Weekly quizzes + oral exams

11. Course Evaluation

- Midterm Exam:25 marks
- Attendance & Quizzes: 5 marks
- Final Exam: 70 marks