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

Academic Program Description

University Name: Al-Muthanna University.
Faculty/Institute: College of Pharmacy
Scientific Department:
Academic or Professional Program Name: Bachelor of Pharmaceutical Sciences.
Final Certificate Name: Bachelor of Pharmacy.
Academic System: Courses
Description Preparation Date: 8/02/2026
File Completion Date: 12/03/2026

Signature:

Head of Department Name:

Date: Zeinab Marwa Thamer
Tammar H. Ali
Noor Thamer
Safa Azhar
Rafat A-Mohammed Jawad

Signature:

Scientific Associate Name:

Date: Ali Abed Ghaban
11/3/2026

The file is checked by:
Quality Assurance and University Performance
Director of the Quality Assurance and University Performance:
Date:
Signature: 11/3/2026

د.م. زينب ستار علي

Approval of the Dean

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

Academic Program Description

University Name: Al-Muthanna University.
Faculty/Institute: College of Pharmacy
Scientific Department:
Academic or Professional Program Name: Bachelor of Pharmaceutical Sciences.
Final Certificate Name: Bachelor of Pharmacy.
Academic System: Courses
Description Preparation Date: 8/02/2026
File Completion Date: 12/03/2026

Signature:
Head of Department Name:
Date:

Signature:
Scientific Associate Name:
Date:

The file is checked by:
Quality Assurance and University Performance
Director of the Quality Assurance and University Performance:
Date:
Signature:

Approval of the Dean

1. Program Vision

The college aspires to assume a solid scientific and academic position among its counterpart colleges in local, international and global academic institutions, by improving the scientific research outputs of its teaching staff, disseminating knowledge, and acquiring the skills and ethics of the pharmacy profession to graduate university pharmacists who will provide health care to all segments of society.

2. Program Mission

The college sought to keep pace with modern educational developments, and to choose the best advanced technical methods under the supervision of teaching staff specialized in the field of pharmacy, to graduate pharmacists possessing high skills in various fields of pharmaceutical sciences who are able to serve public health institutions by providing a stimulating environment for learning and innovation to build a healthy society.

3. Program Objectives

1 - Graduating experienced and competent graduate pharmacists who contribute in practice with their acquired scientific and practical experience in the health field.
2 - Active contribution to community health service by spreading awareness and health culture about the use of drug treatments and their role in the therapeutic aspect of patients.
3 - Striving to compete and enter the ranks of local and international academic classifications by enhancing the role of the fields of pharmaceutical sciences in program accreditation and improving the quality of the solid educational and research process.
4 - Developing the skills of functional cadres and improving their administrative role with the development taking place in the field of electronic governance.
5 - Diversity in pharmaceutical specialties for highly qualified teaching staff to contribute to the preparation of pharmacists capable of providing treatment to patients.
6 - Urging the development and encouragement of the academic and research aspect of a medical and health nature in the field of pharmacy and drug manufacturing by providing a supportive environment for scientific research.
7 - Improving and developing the college's infrastructure facility and its sustainability in a way that suits and serves its staff, students, and the community.
8 - Developing students' scientific and research skills and enhancing their academic and educational role to serve the labor market.

4. Program Accreditation

Does the program have program accreditation? And from which agency?

No

5. Other external influences

Ministry of Higher Education and Scientific Research

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	5	10		
College Requirements	53	180		
Department Requirements	None	None		
Summer Training	None	None		
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
4th		Clinical pharmacy I	2	2
4th		Clinical pharmacy II	2	2
4th	215	Communication skills	2	N/A
5th	529	Therapeutic drug monitoring	2	N/A
5th		Applied Therapeutic I	3	N/A
5th		Applied Therapeutic II	2	N/A
5th	527	Pharmacoeconomy	2	N/A
5th		Hospital training	N/A	4
1st	115	Biostatistics	2	N/A
1st		language English I	2	N/A
1st		Arabic language	2	N/A
1st		Democracy and Human rights	2	N/A

1st	127	Human anatomy and Histology	3	2
1st	129	Medical Physics	1	2
1st		computers	1	2
2nd		computers	N/A	2
2nd	212	Microbiology I	3	2
2nd	222	Microbiology II	3	2
2nd		Baath crimes	2	N/A
3rd	314	Biochemistry I	3	2
3rd	315	Pathophysiology	3	2
3rd	329	Biochemistry II	3	2
4th	415	Public Health	2	N/A
5th	514	Clinical Chemistry	3	2
5th	515	Clinical Laboratory Training	N/A	4
1st	112	Principle of pharmacy	2	N/A
1st	128	Pharmaceutical calculation	3	2
2nd	213	Physical pharmacy I	3	2
2nd	228	Physical pharmacy II	3	2
3rd	313	Pharmaceutical technology I	3	2
3rd	328	Pharmaceutical and cosmetic preparation	3	2
4th	414	Biopharmaceutics	2	2
4th	4210	Industrial pharmacy I	3	2
5th	512	Industrial pharmacy II	3	2
5th	5212	Drug delivery system design	2	N/A
5th	5213	Pharmaceutical Biotechnology	1	N/A
1st	113	Analytical chemistry	3	2
1st	1210	Organic chemistry I	3	2
2nd	211	Organic chemistry II	3	2
2nd	226	Organic chemistry III	2	2
3rd	311	Inorganic pharmaceutical chemistry	2	2
3rd	326	Organic pharmaceutical chemistry I	3	2
4th	412	Organic pharmaceutical chemistry II	3	2
4th	427	Organic pharmaceutical chemistry III	3	2
5th	511	Organic pharmaceutical chemistry IV	2	N/A
5th	5210	Advance pharmaceutical analyses	3	2
2nd	2210	Pharmacognosy I	3	2
3rd	312	Pharmacognosy II	2	2
3rd	3210	Pharmacognosy III	2	2
1st	116	Medical terminology	1	N/A
1st		Physiology I	3	2
2nd	214	Physiology I	3	2
2nd	229	Physiology II	3	2
3rd	3211	Ethics	1	N/A
3rd	327	Pharmacology I	3	N/A
4th	411	Pharmacology II	3	2
4th	426	Pharmacology III	2	N/A
4th	429	General Toxicology	2	2

5th	516	Clinical Toxicology	2	2

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	✓ To able to work as a team under the supervision of the physicians in hospitals. ✓ How to deal with medication prescriptions in a correct safe way ✓ Learning Outcomes Statement 1 – Establish a multidisciplinary healthcare team, which can provide value-added evidence-based knowledge that is applied to clinical cases in the interest of improving patient outcomes and experiences. ✓ Follow up on developments in techniques used in clinical chemistry as well as in molecular diagnostics and the impact of automation in this field. ✓ Detection of many biomolecules using different biochemical methods. ✓ Knowledge of the fields of laboratory analysis. ✓ Introducing the basic concept of computer science. ✓ Understanding other topics covering topics related to pharmacy, such as the most important bacterial, viral, and parasitic diseases, as well as introducing the most important immunological concepts, such as understanding the mechanism of action of the immune system and the most important diseases resulting from excessive or decreased immune response. ✓ Knowledge about basic concept of mathematics and statistics. Introducing the basic concept of medical physics. ✓ Understanding other topics, most notably topics related to pharmacy ✓ The course deals with the concept of basic hardware, software, computers and their applications in the field of information technology.

Skills	
Learning Outcomes 2	✓ Provides students with the knowledge, skills and efforts required to work in diagnosing diseases through laboratory tests and hospital, college of pharmacy or private care. ✓ Understanding the future of regenerative medicine and the principle of living cell therapy that has the ability to repair damaged pathways, renew the immune system, and restore health to many living with chronic disease and damaged tissue. ✓ Know the nature and occurrence of biochemical reactions within the body, including basic substances such as carbohydrates, fats, amino acids and protein. Study and reveal these substances in terms of their increases and decreases in sick people.
Ethics	
Learning Outcomes 4	✓ Use appropriate antibiotics in treatment according to the laboratory result report. ✓ Emphasizing the knowledge and skills required to efficiently perform the duties and responsibilities of a pharmacist. ✓ Upon completion of the course, students will be able to understand computer applications in the medical field.
Learning Outcomes 5	Learning Outcomes Statement 5

9. **Teaching and Learning Strategies**

Cooperative education strategy.

Teaching strategy brainstorming.

Education strategy one minute paper.

Education strategy real-time feedback

Education strategy notes series.

10. Evaluation methods

Theoretical exam.

Practical exam.

Class activities.

Laboratory exam.

Practical evaluation.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professor	Chemistry science	Biochemistry			1	
		Organic chemistry			1	
Assistant Professor	Veterinary medicine	Physiology			1	
		Histology			1	
		Pharmacology and Toxicology			1	
	Biology sciences	Biology sciences			1	
	Chemistry science	Biochemistry			1	
		Inorganic chemistry			1	
	Food industry	Biotechnology			1	
	pharmacy	Pharmaceutical sciences			2	
		Clinical pharmacy			1	
		Pharmacology			1	

		and therapeutics				
Lecture	Field crops	Medicinal plants			1	
	Chemistry science	Inorganic chemistry			1	
	Biology sciences	Cell physiology			1	
	Physics Science	Medical physics			1	
Assistant Lecture	Pharmacy	Pharmacology and therapeutics			1	
		pharmaceutics			1	
		Pharmaceutical Sciences			1	
	Biology sciences	Microbiology			2	
		Botany			1	
	Arabic language education	Arabic language education			1	
	Law	Special law			2	
	Livestock	Animal production			1	
	Chemistry science	Inorganic chemistry			2	
	Veterinary medicine	Physiology			1	
	Management and Economics	Accounting			1	
	Chemistry science	Biochemistry			1	

Professional Development
Mentoring new faculty members
Guidance lectures Courses in laboratory skills. Seminars Discussion sessions. Orientation meetings
Professional development of faculty members
Guidance lectures Courses in laboratory skills. Seminars

Discussion sessions. Orientation meetings

12. **Acceptance Criterion**
Central admission to the Ministry of Higher Education and Scientific Research / Iraq according to the student's grades

13. **The most important sources of information about the program**
Presidency University Committee of Deans of Colleges of Pharmacy in Iraq

14. Program Development Plan
An improvement plan prepared by the college dean. Laboratory improvement plan.

Program Skills Outline																
Clinical and laboratory sciences branch				Required program Learning outcomes												
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics				
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	
	115	Biostatistics	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		language English I	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		Arabic language	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		Democracy and Human rights	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	127	Human anatomy and Histology	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	129	Medical Physics	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		computers	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2nd	**212**	Microbiology I	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	222	Microbiology II	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		Baath crimes	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		computers	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
3rd	**314**	Biochemistry I	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	315	Pathophysiology	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	329	Biochemistry II	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

4th	**415**	Public Health	**Basic**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5th	**514**	Clinical Chemistry	**Basic**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	515	Clinical Laboratory Training	**Basic**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Program Skills Outline															
clinical pharmacy				**Required program Learning outcomes**											
Year/Level	**Course Code**	**Course Name**	**Basic or optional**	**Knowledge**				**Skills**				**Ethics**			
				A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**
4th		**Clinical pharmacy 1**	**basic**	/	/	/	/	/	/	/		/	/		
		Clinical pharmacy 2	**basic**	/	/	/	/	/	/	/		/	/		
4th	**215**	**Communication skills**	**basic**	/	/	/	/	/	/	/	/	/	/		
5th	**529**	**Theraputic drug monitoring**	**basic**	/	/	/	/	/	/	/	/	/	/		
	527	**pharmacoeconomics**	**Basic**	/	/	/	/	/	/	/		/	/		
5th		**Applied Theraputics 1**	**basic**	/	/	/	/	/	/	/		/	/		
		Applied theraputics 2	**basic**	/	/	/	/	/	/	/		/	/		
5th		**Hospital training**	**basic**	/	/	/	/	/	/	/		/	/		

Program Skills Outline																
Pharmaceutics				**Required program Learning outcomes**												
Year/Level	**Course Code**	**Course Name**	**Basic or optional**	**Knowledge**				**Skills**				**Ethics**				
				A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	
1st	**112**	**Principle of pharmacy**	**Basic**	/	/	/	/	/	/	/	/	/	/	/	/	
	128	**Pharmaceutical calculation**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	
2nd	**213**	**Physical pharmacy I**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	
	228	**Physical pharmacy II**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	
3rd	**313**	**Pharmaceutical technology I**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	
	328	**Pharmaceutical and cosmetic preparation**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	
4th	**414**	**Biopharmaceutics**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	
	4210	**Industrial pharmacy I**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	
5th	**512**	**Industrial pharmacy II**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	
5th	**5212**	**Drug delivery system design**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	
5th	**5123**	**Pharmaceutical biotechnology**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	

Program Skills Outline																
Pharmaceutical Chemistry				Required program Learning outcomes												
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics				
				A 1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	
1st	113	Analytical Chemistry	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	1210	Organic chemistry I	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2nd	211	Organic chemistry II	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	226	Organic chemistry III	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
3rd	311	Inorganic pharmaceutical chemistry	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	326	Organic Pharmaceutical Chemistry I	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
4th	412	Organic Pharmaceutical Chemistry II	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	427	Organic Pharmaceutical Chemistry III	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
5th	511	Organic pharmaceutical chemistry IV	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	5210	Advance pharmaceutical analyses	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Program Skills Outline															
Pharmacology and toxicology				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
1st	116	Medical terminology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
2nd		Physiology I	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	214	Physiology II	Basic	√	√	√	√	√	√	√	√	√	√	√	√
2nd	229	Physiology III	Basic	√	√	√	√	√	√	√	√	√	√	√	√
3rd	3211	Ethics	Basic	√	√	√	√	√	√	√	√	√	√	√	√
3rd	327	Pharmacology I	Basic	√	√	√	√	√	√	√	√	√	√	√	√
4th	429	General toxicology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
4th	411	Pharmacology II	Basic	√	√	√	√	√	√	√	√	√	√	√	√
4th	426	Pharmacology III	Basic	√	√	√	√	√	√	√	√	√	√	√	√
5th	516	Clinical Toxicology	Basic	√	√	√	√	√	√	√	√	√	√	√	√

Program Skills Outline

Pharmacognosy				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2nd	2210	Pharmacognosy I	Basic	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
3rd	312	Pharmacognosy II	Basic	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	3210	Pharmacognosy III	Basic	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔

Course Description Form

1. Course Name:
Analytical Chemistry
2. Course Code:
113
3. Semester / Year:
1st Class/ 1st semester
4. Description Preparation Date:
6/2/2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
5 hours per week (3 theoretical hours and 2 practical hours) / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: **Assist Prof Dr. Rusul Alabada** Email: **Dr.Rusul.Alabada@mu.edu.iq**
8. Course Objectives

Course Objectives	• Understand the fundamentals of classical and instrumental analytical techniques. • Apply statistical tools in interpreting analytical data. • Recognize the role of pharmacopoeias in pharmaceutical quality control. • Perform basic titrimetric and gravimetric analyses relevant to pharmaceutical compounds
9. Teaching and Learning Strategies	
Strategy	The course relies on interactive lectures to clarify basic concepts, along with problem-solving and practical applications to develop analytical thinking, linking theoretical aspects to laboratory and pharmaceutical applications, in addition to using modern educational tools and continuous assessment to evaluate the level of student understanding.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	3	• Define analytical chemistry and its main branches. • Explain the role of analytical chemistry in drug development and quality control. • Recognize the importance of analytical methods in ensuring drug safety and efficacy.	Introduction to Analytical Chemistry: Types and roles in drug development and QC	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Short questions -Short quiz

2nd	4	• Identify different units of concentration and their applications. • Distinguish between primary and secondary standards. • Prepare standard and working solutions accurately.	Review of Basic Concepts: Concentration units, standards, solution preparation	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Short arithmetic problems -Homework (preparing solutions/concentration units)
3rd	4	• Describe the purpose and structure of major pharmacopoeias. • Interpret pharmacopoeial monographs and specifications. • Understand the regulatory importance of pharmacopoeias.	Introduction to Pharmacopoeias: USP, BP, monographs, specifications	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Guided classroom discussion - Short explanatory questions about monographs
4th	2	• Apply pharmacopoeial requirements to practical case studies. • Explain the principles of method validation according to ICH Q2(R1). • Relate analytical validation parameters to quality assurance.	Case Study: Interpreting pharmacopoeial monographs and ICH Q2(R1) overview	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Guided classroom discussion - Short explanatory questions about monographs
5th & 6th	5	• Explain the principles of gravimetric analysis. • Perform gravimetric calculations accurately. • Identify sources of error and methods to minimize them.	Gravimetric Analysis: Precipitation, weighing, error sources	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Math problems - A short quiz focusing on sources of error

7th & 8th	5	• Explain the principles of acid-base titrations. • Select suitable indicators based on pH range. • Perform titration calculations accurately.	Volumetric Analysis I: Acid-base titrations, indicators, pH, calculations	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Calibration problems - Quiz on choosing the proof and calculations
9th	3	• Describe principles of precipitation, complexometric. • Differentiate between Mohr, EDTA, iodometric, and permanganometric methods. • Apply these titrations in pharmaceutical analysis.	Volumetric Analysis II: Precipitation and Complexometric titrations (Mohr, EDTA)	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	Calibration problems Quiz on choosing the proof and calculations
10th	3	•Describe principles of redox titrations. •Differentiate between Mohr, EDTA, iodometric, and permanganometric methods. •Apply these titrations in pharmaceutical analysis.	Redox Titrations: Principles, iodometry, permanganometry	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Practical problems -Comparative questions between calibration methods
11th & 12th	7	• Calculate mean, standard deviation, and confidence limits. • Apply Q-test and Grubbs test for data evaluation. • Assess accuracy and precision of analytical results.	Statistical Evaluation of Data: Mean, SD, confidence limits, Q-test, Grubbs test	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Statistical problems - Analysis of simple laboratory data
13th	3	•Explain the principles of UV-	UV-Visible Spectrophotometry:	Topics are presented using:	- Application issues of the

		Visible spectrophotometry. • Apply Beer–Lambert law in quantitative analysis. • Use UV-Vis methods in pharmaceutical applications.	Principles, Beer's Law, applications	Whiteboard + Data Projector + PDF Lecture	Beer-Lambert law - Quiz
14th	3	• Explain the principles of potentiometric and conductometric methods. • Use electrodes for quantitative measurements. • Apply electrochemical methods in analytical determinations.	Electrochemical Methods: Potentiometry, Conductometry	Topics are presented using: Whiteboard + Data Projector + PDF Lecture Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Explanatory questions - Short problems on potential/conductivity measurements
15th	3	• Explain the basic principles of chromatographic separation. • Differentiate between TLC and paper chromatography. • Apply chromatographic methods for qualitative analysis.	Introduction to Chromatography: TLC, paper chromatography	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	-Questions of differentiation and comparison - Interpretation of chromatographic separation results

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

40% striving (20% mid-term exam score, 20% daily preparation, daily and oral exams, and classroom activities) 60% final exam score

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**1)** Fundamentals of Analytical Chemistry – Skoog, West, Holler & Crouch **2)** Pharmaceutical Analysis – A.H. Beckett & J.B. Stenlake **3)** Quantitative Chemical Analysis – Daniel C. Harris **4)** Supplementary: British Pharmacopoeia (BP), United States Pharmacopeia (USP), ICH Q2(R1)

Main references (sources)	• **Vogel's Textbook of Quantitative Chemical Analysis** Mendham, J.; Denney, R. C.; Barnes, J. D.; Thomas, M. J. K. • **AnalyticalChemistry** Gary D. Christian
Recommended books and references (scientific journals, reports...)	- **Critical Reviews in Analytical Chemistry** - **Journal of Chemometrics** - **Special Issue on Pharmaceutical Analytical Applications** - **PubChem**
Electronic References, Websites	https://www.usp.org https://www.pharmacopoeia.com https://www.ich.org/page/quality-guidelines

13. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	2	Recognize laboratory equipment, their functions, and proper handling for safe analytical practice	Demonstration of some laboratory equipment.	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
2nd	2	Apply volumetric analytical techniques for quantitative determination using titration principles.	Volumetric method of analysis	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
3rd	2	Prepare and standardize a hydrochloric acid solution of known concentration using primary standards.	Preparation and standardization of HCl solution (known)	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
4th	2	Determine the concentration of an unknown hydrochloric acid solution by standardization methods.	Preparation and standardization of HCl solution (unknown)	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report

5th	2	Prepare and standardize sodium hydroxide solution for use in acid–base titrations.	Preparation and standardization of NaOH solution	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
6th	2	Determine the percentage of acetic acid in a given sample using acid–base titration.	Determination of the percentage of acetic acid.	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
7th	2	Analyze a mixture of sodium carbonate and sodium hydroxide using differential titration techniques.	Analysis of sodium carbonate and sodium hydroxide mixture.	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
8th	2	Determine chloride ions quantitatively using the Mohr argentometric titration method.	Determination of chloride by the Mohr method.	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
9th	2	Quantitatively determine chloride ions using the Volhard back-titration method	Determination of chloride by the Volhard method	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
10th	2	Determine ferrous iron content in Mohr’s salt using redox titration techniques	Determination of ferrous form of iron in Mohr's salt.	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
11th	2	Determine total water hardness using complexometric titration with EDTA	Determination of total hardness in tab water	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report

12th	2	Determine nickel content quantitatively using gravimetric analysis principles.	Gravimetric determination of Nickel.	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report

Course Description Form

1. Course Name:
Organic chemistry II
2. Course Code:
211
3. Semester / Year:
2nd Class/ 1st semester
4. Description Preparation Date:
14/2/2026
5. Available Attendance Forms:
Present
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours 3 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr.Farah Jameel hasan Email: chemfrh.mu.edu.iq
8. Course Objectives

Course Objectives	**enable students to understand the chemistry of carbon, and the classification, properties and reactions of organ compounds. It includes understanding the basic structu and properties of organic halides, carboxylic acids, aldehydes, ketones and amines, in addition to the principles and application of stereochemistry on these compounds**

9. Teaching and Learning Strategies	
Strategy	

10. Course Structure

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

1-3 4-5 6-7 8-9 10-13 14-15	10 5 7 6 12 5		Aromatic Hydrocarbons (includes benzene, electrophilic aromatic substitution, arenas and their derivatives.(Carboxylic acids: properties and reactions Functional derivatives of carboxylic acid Amines I and II . Aldehydes and ketones (include also aldol and Claisen condensation); Classification, reactions and properties Phenols.	Lectures	Mid exam Oral exam Final 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

Mid exam 25%
Oral exam 10%
Report 5%
Final exam 60%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Organic Chemistry by Robert T. Morrison andRobert N. Boyd. Organic Chemistry by McCurry; 5th e Thomason learning; CA,USA 2000.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Journals for Medical Science
Electronic References, Websites	Wikipedia

Course Description Form

1. Course Name:
Inorganic Pharmaceutical Chemistry
2. Course Code:
311
3. Semester / Year:
3rd Class/ 1st semester
4. Description Preparation Date:
6 - 2 -2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours per week (2 theoretical hours and 2 practical hours) / 3 units
7. Course administrator's name (mention all, if more than one name)
Name: Assist Prof Dr. Rusul Alabada **Email: dr.rusul.alabada@mu.edu.iq**

8. Course Objectives

Course Objectives	• Understanding the properties and reactions of inorganic compounds of pharmaceutical significance. • Identifying the role of elements and complexes in biological systems. • Studying the use of inorganic compounds in drug formulation and therapy. • Analyzing the relationship between chemical structure and pharmacological effect. • Applying safety principles when handling inorganic substances in the laboratory.

9. Teaching and Learning Strategies

Strategy	• Enabling students to understand the structure of inorganic compounds and their biological reactions. • Connecting theoretical concepts with pharmaceutical and medical applications. • Developing analytical and critical thinking skills in dealing with pharmaceutically important inorganic elements and complexes.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	2	The ability to explain lithium and sodium, their biological importance, and their pharmaceutical applications.	**Alkali Metals**: Lithium, Sodium, Potassium: Electron configuration, chemial properties of metals, Advantages and disadvantages using lithium-based drugs, Sodium as an essential ion in the	• Whiteboard • Projector (Data Show) • Lecture PDF	- Short questions - Short quiz

			human body, Active transport of sodium ions, Drugs, diet and toxicity of sodium ions, Potassium and its clinical application.		
2 nd	2	The ability to explain the chemistry of nutrients and calcium, their biological importance, and their pharmaceutical applications.	**Alkaline Earth Metals**: Magnesium, Calcium: Electron configuration of metals, Major uses and Chemical properties, Magnesium Biological importance and clinical applications and preparations. Calcium: the key to many human functions.	• Whiteboard • Projector (Data Show) • Lecture PDF	- Short questions - Short quiz
3rd & 4th	4	A specialization in Group 13 elements and their connection to medical and clinical uses.	**Group 13:** Aluminium, Boron and Gallium: General chemistry of group 13 elements, Pharmaceutical applications of boric acid, Bortezomib, Biological importance of Aluminiumant its adjuvants, Antacids, Aluminium-based therapeutics, Phosphate binders, Antiperspirant. Gallium Introduction, Chemistry, Pharmacology of gallium-based drugs and their uses	• Whiteboard • Projector (Data Show) • Lecture PDF	- Short questions - Short quiz
5th	2	The ability to differentiate between carbon-based and silicon-based drugs and explain the concept of isotopes in drug design.	**The Carbon Group**: General chemistry of group 14 elements, Silicon-based drugs versus carbon-based analogues, Introduction of silicon groups, Silicon isosters, Organosilicon drugs.	• Whiteboard • Projector (Data Show) • Lecture PDF	- Short questions - Short quiz
6th & 7 th	4	Specialization in discussing the role of transition metals in biomedicine and	**Transition Metals and d-Block Metal Chemistry:** Electronic configurations, platinum	• Whiteboard • Projector (Data Show)	- Short questions - Short quiz

		their therapeutic and clinical applications.	anticancer agents, Iron and its role in biological systems, clinical applications. Copper-containing drugs, Silver: the future of antimicrobial agents?, Gold: the fight against rheumatoid arthritis and zinc and its role in biological systems, clinical applications and toxicity.	• Lecture PDF	
8th	2	The ability to explain poisoning by various metals and the diverse alternative treatments.	**Chelation Therapy**: What is heavy-metal poisoning? What is chelation? Chelation therapy, Calcium disodium edetate, Dimercaprol (BAL), Dimercaptosuccinic acid (DMSA), 2,3-Dimercapto-1-propanesulfonic acid (DMPS), and Lipoic acid (ALA).	• Whiteboard • Projector (Data Show) • Lecture PDF	- Short questions - Short quiz
9th	2	The ability to identify the states of food substances and explain their role in poisoning.	Protective adsorbents	• Whiteboard • Projector (Data Show) • Lecture PDF	- Short questions - Short quiz
10th	2	The ability to describe topical inorganic agents and explain their therapeutic and pharmaceutical uses.	Topical agents	• Whiteboard • Projector (Data Show) • Lecture PDF	- Short questions - Short quiz
11th	2	The ability to explain the role of dental inorganic agents in combating the causes of dental diseases.	Dental agents	• Whiteboard • Projector (Data Show) • Lecture PDF	- Short questions - Short quiz
12th	2	Explain the principles of organometallic chemistry and metallocenes, with emphasis on the therapeutic potential of	**Organometallic Chemistry**: What is organometallic chemistry and metallocenes? Ferrocene derivatives as potential antimalarial agent and	• Whiteboard • Projector (Data Show) • Lecture PDF	- Short questions - Short quiz

		ferrocene, titanocene, and vanadium-based compounds in anticancer and antidiabetic applications.	antibreast cancer, Titanocenes in titanium-based anticancer agents and Vanadocene dichloride as anticancer agents, Further vanadium-based drugs: insulin mimetics.		
13th &14th	4	The ability to explain the principles of reading and therapeutic use of radioactive compounds.	**Radioactive Compounds and Their Clinical Application**, Radiopharmacy: dispensing and protection, Therapeutic use of radiopharmaceuticals.	• Whiteboard • Projector (Data Show) • Lecture PDF	- Short questions - Short quiz
15th	2	The ability to describe pharmaceutical preparations used in diagnosis and their new significance.	Radiopharmaceuticals for imaging	• Whiteboard • Projector (Data Show) • Lecture PDF	- Short questions - Short quiz

11. Course Evaluation

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

40% striving (20% mid-term exam score, 20% daily preparation, daily and oral exams, and classroom activities) 60% final exam score

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**1) Essentials of Inorganic Chemistry For Students of Pharmacy, Pharmaceutical Sciences and Medicinal Chemistry by KATJA A. STROHFELDT, School of Pharmacy, University of Reading, UK** **2) Inorganic Medicinal and Pharmaceutical Chemistry by Block, Roche Soine and Wilson, latest edition**
Main references (sources)	• **Textbook of Inorganic Medicinal Chemistry – G.R. Chatwal** • **An Introduction to Medicinal Inorganic Chemistry – Gareth R. Williams** • **US Pharmacopeia (USP) and British Pharmacopeia (BP)**
Recommended books and references (scientific journals, reports...)	• **Medicinal Chemistry: The Role of Inorganic Elements in Medicine** – R.K. Sharma • **Inorganic Chemistry for Dummies** – Michael Matson & Alvin W. Orbaek

	• **Principles of Bioinorganic Chemistry** – S.J. Lippard & J.M. Berg • **Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life** – Wolfgang Kaim, Brigitte Schwederski
Electronic References, Websites	• pubchem.ncbi.nlm.nih.gov • drugbank.ca • sciencedirect.com • link.springer.com • rsc.org • chemspider.com • usp.org • pharmacopoeia.com

13. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	2	The ability to prepare Calcium carbonate by precipitation and evaluate its purity.	To prepare and submit calcium carbonate ($CaCO_3$).	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
2nd	2	The ability to prepare Magnesium Carbonate by precipitation and evaluate its purity.	To prepare and submit magnesium carbonate ($MgCO_3$)	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
3rd	2	The ability to prepare Zinc sulphate and relate its properties to pharmaceutical uses.	To prepare and submit Zinc sulphate ($ZnSO_4$).	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
4th	2	The ability to prepare potassium alum and explain its pharmaceutical applications.	To prepare and submit Potash alum (K_2SO_4. $Al_2(SO4)_3.24\ H_2O$)	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report

5th	2	The ability to prepare boric acid and identify its pharmaceutical and antiseptic uses.	To prepare and submit Boric acid (H_3BO_3)	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
6th	2	The ability to prepare aluminum hydroxide and relate its use as an antacid.	To prepare and submit aluminum hydroxide.	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
7th	2	The ability to perform the iron limit test according to the requirements of pharmacopoeias	To perform limit test for iron in given sample.	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
8th	2	The ability to perform the chloride limit test and interpret its results.	To perform limit test for chloride in given sample.	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
9th	2	The ability to identify sulfate impurities using approved limit test procedures.	To perform limit test for sulphate in given sample.	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
10th	2	The ability to identify boric acid using qualitative identification tests	To perform identification test for boric acid.	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
11th	2	The ability to identify ammonium chloride through its characteristic	To perform the identification test of ammonium chloride.	• Whiteboard • Projector (Data Show) + Practical application	- Short questions - Quiz - Experiment report

		chemical reactions		of the experiment	
12th	2	The ability to evaluate the acid-neutralizing capacity of aluminum hydroxide gel	Acid neutralising capacity of aluminium hydroxide gel	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
13th	2	The ability to relate practical observations to theoretical principles for identifying unknown samples	(unknown sample).	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
14th	2	The ability to relate practical observations to theoretical principles for identifying unknown samples	(unknown sample).	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
15th	2	The ability to relate practical observations to theoretical principles for identifying unknown samples	(unknown sample).	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report

Course Description Form

1. Course Name:

Organic Pharmaceutical Chemistry (II)

2. Course Code:

412

3. Semester / Year:

4th Class/ 1st Semester

4. Description Preparation Date: 20/2/2024

6−2−2026

5. Available Attendance Forms:

Full-time students

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

3h. Theory+1 h. practical/ 4h

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

Name: tammar hussein ali
Email: tammar@mu.edu.iq

8. Course Objectives

Course Objectives	1. To the discovery and development of new agents for treating diseases and enab the translating of the drug structural formula into therapeutic effect. 2. It focuses on the methods of preparation for some pharmaceutical agents.

9. Teaching and Learning Strategies

Strategy	1. Active participation by engaging actively in lectures and discussions. 2. Effective time management by creating a study schedule. 3. Utilize resources. 4. Collaborative learning from study groups. 5. Hands-on experience by taking advantage of laboratory sessions. 6. Regularly review previous topics to ensure retention of information.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	3	Cholinergic System	Cholinergic agents, Cholinergic receptors, and their subtypes	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz

2nd	3	Cholinergic System	Stereochemistry and structure-activity relationships (SAR); Products.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
3rd	3	Cholinergic System	Cholinesterase inhibitors; Cholinergic blocking agen structure-activity relationships (SAR).	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
4th	3	Cholinergic System	Solanaceous alkaloids and analogues; Synthetic cholinergic blocking agent and products. Ganglionic blocking agents (neuromuscular blocking agents).	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
5th	3	Adrenergic System	Adrenergic agents (Adrenergic neurotransmitters); Adrenergic receptors.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
6th	3	Adrenergic System	Drugs affecting Adrenergi neurotransmission; Sympathomimetic agents.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
7th	3	Adrenergic System	Adrenergic receptor antagonists.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
8th	3	CNS depressant	Benzodiazepines and rela compounds; Barbiturates.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
9th	3	CNS depressant	CNS depressant with skele muscle relaxant propertie Antipsychotics; Anticonvulsants.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
10th	3	CNS Stimulants	CNS Stimulants	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
11th	3	Drugs affecting the cardiovascular system	Drugs affecting the Renin Angiotensin pathway and calcium blockers, vasodilators.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz

12th	3	Drugs affecting the cardiovascular system Histamine and anti-histaminic agents	vasodilators. Structure–activity relationships at H-1 receptors ;first-generation antihistamine classes ; second-generation antihistamines;	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
13th	3	Histamine and anti-histaminic agents	recent antihistamine developments: the“ dual-acting” antihistamines; histamine H-2antagonists structural derivation of th “H-2antagonists”	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
14th	3	NSAIDs	Cyclooxygenases; Therapeutic Classification SAR.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
15th		Exam	Exam		

11. Course Evaluation

Midpoints are 40 come from:

1. 15 points theory exam + 5 points for quizzes, and presentations.
2. 10 points as practical exam + 5 points for quizzes, 5 points for reports, and attendance.

The final point is 60 comes from the theory final exam.
The Total points of evaluation is 100.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. Wilson and Gisvold Textbook of Organic medicinal and Pharmaceutical chemistry, Delgado JN, Remers WA, (Eds); 10th ed, 2004
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Organic Pharmaceutical Chemistry (IV)
2. Course Code:
511
3. Semester / Year:
5th Class/ 1st Semester
4. Description Preparation Date:
6-2-2026
5. Available Attendance Forms:
Full-time students
6. Number of Credit Hours (Total) / Number of Units (Total)
2h. Theory+0 h. practical/ 2h
7. Course administrator's name (mention all, if more than one name)
Name: Tammar H. Ali Email: tammar@mu.edu.iq
8. Course Objectives

Course Objectives	1. To give the students' knowledge and experience in pro-drug and hormones as part of their medicinal and pharmaceutical field. 2. It includes classification, synthesis, biotransformation, and/or formulation of certain drugs to improve their action as well as to avoid some side effects.

9. Teaching and Learning Strategies

Strategy	1. Active participation by engaging actively in lectures and discussions. 2. Effective time management by creating a study schedule. 3. Utilize resources. 4. Collaborative learning from study groups. 5. Hands-on experience by taking advantage of laboratory sessions. 6. Regularly review previous topics to ensure retention of information.

10. Course Structure

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

1st	2	The basic concept of prodrugs	Covalent bonds (cleavable)	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
2nd	2	The basic concept of prodrugs	Prodrugs of functional groups	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
3rd	2	The basic concept of prodrugs	Types of prodrugs	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
4th	2	Chemical prodrug delivery systems	Chemical delivery systems.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
5th	2	Chemical prodrug delivery systems	Polymeric prodrugs.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
6th	2	Chemical prodrug delivery systems	Types and structure of polymers.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
7th	2	Chemical prodrug delivery systems	Cross-linking reagents.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
8th	2	Drug targeting	Drug targeting for monomer.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
9th	2	Drug targeting	Drug targeting for polymer.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
10th	2	Combinatorial chemistry	Peptides and other linear structures; Drug-like molecules.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz

11th	2	Combinatorial chemistry	Support and linker; Solution-phase combinatorial chemistry.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
12th	2	Combinatorial chemistry	Detection, purification, and analgesics.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
13th	2	Combinatorial chemistry	Encoding combinatorial libraries; High-throughput screening.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
14th	2	Combinatorial chemistry	Virtual screening; Chemical diversity and library design.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
15th		Exam	Exam		

11. Course Evaluation

Midpoints are 40 come from:

1. 15 points theory exam + 5 points for quizzes, and presentations.
2. 10 points as practical exam + 5 points for quizzes, 5 points for reports, and attendance.

The final point is 60 comes from the theory final exam.
The Total points of evaluation is 100.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. Wilson and Gisvold Textbook of Organic medicinal and Pharmaceutical chemistry, Delgado JN, Remers WA, (Eds); 10th ed, 2004
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Organic Chemistry
2. Course Code:
1210
3. Semester / Year:
1st Class/ 2nd semester
4. Description Preparation Date:
6/2/2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
5 hours per week (3 theoretical hours and 2 practical hours) / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: **Assist Prof Dr. Rusul Alabada** Email: **Dr.Rusul.Alabada@mu.edu.iq**
8. Course Objectives

Course Objective	• **Introduce students to the fundamentals of organic chemistry**, including atomic structure, chemical bonding, and functional groups, while highlighting their significance in the study of pharmaceutical sciences. • **Enable students to understand the nomenclature, classification, and physicochemical properties of organic compounds**, and to relate these properties to their molecular structures. • **Familiarize students with basic organic reactions in a simplified manner**, emphasizing their relevance to pharmaceutical applications and the synthesis of compounds of pharmaceutical importance.
9. Teaching and Learning Strategies	
Strategy	The course relies on interactive lectures to explain and clarify fundamental concepts, complemented by exercises, problem-solving, and practical applications aimed at developing students' analytical thinking skills. It also emphasizes linking theoretical aspects with laboratory and pharmaceutical applications, in addition to utilizing modern educational tools and implementing continuous assessment to evaluate students' understanding of the material.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	3	• The student learns the fundamentals of the electronic structure of molecules and the relationship between chemical structure and the physical properties of organic compounds.	Introduction (Structure and properties: Atomic and molecular orbitals, Hybrid orbitals, Intermolecular forces, Polarity, Structure and physical	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Short questions -Short quiz

			properties))		
2nd	4	• The student understands the structure of alkanes, their physical and chemical properties, and their basic reactions.	Alkanes and methane.	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Short questions -Short quiz
3rd	4	• The student grasps the nature of double bonds and the addition and isomerization reactions in alkenes and dienes.	Alkenes and dienes.	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Short questions -Short quiz
4th	3	The student learns the properties of alkynes and their distinctive reactions compared to alkenes.	Alkynes	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Short questions -Short quiz
5th	3	• The student understands the structure of cyclic alkanes, their spatial configurations, and their stability.	Cycloalkanes.	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Short questions -Short quiz
6th& 7th	8	• The student grasps the principles of stereoisomerism and its importance in the activity of pharmaceutical compounds	Stereochemistry I & II	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Short questions - Short quiz

8th	3	• The student understands the properties of alkyl halides and the mechanisms of substitution and elimination reactions.	Alkyl halides.	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Short questions -Short quiz
9th & 10th	6	• The student learns the structure, properties, and reactions of alcohols and ethers and their pharmaceutical importance.	Alcohols and ethers.	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Short questions -Short quiz
11th	4	• The student understands the properties of phenols, their reactions, and their pharmacological effects.	Phenols.	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Short questions -Short quiz
12th&13th	7	• The student learns the structure of benzene, the mechanisms of aromatic substitution, and the applications of aromatic compounds in pharmacy.	Aromatic Hydrocarbons (includes benzene, electrophilic aromatic substitution, arenas and their derivatives).	Topics are presented using: Whiteboard + Data Projector + PDF Lecture	- Short questions -Short quiz

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc **40% striving (20% mid-term exam score, 20% daily preparation, daily and oral exams, and classroom activities) 60% final exam score**	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**1)** Organic Chemistry: by John McMurry 10th Ed, 2023 **2)** Organic Chemistry: Structure and Function (8th Edition) by Vollhardt and Schore. **3)** Organic Chemistry by Robert T. Morrison and Robert N. Boyd.
Main references (sources)	• **Essentials of Organic Chemistry — Paul M. Dewick** • **Organic Chemistry — Janice Gorzynski Smith**
Recommended books and references (scientific journals, reports...)	- **Fundamentals of Organic Chemistry — Leroy G. Wade / Jan Simek** - **Practical Organic Chemistry (Techniques and Qualitative Analysis)**

Electronic References, Websites	https://chem.libretexts.org https://onlinelibrary.wiley.com/journal/16154169

13. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	2	Determine the melting point of a known compound and relate it to purity and identity.	Determination of melting point (Known sample).	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
2nd	2	Identify an unknown compound by measuring its melting point and comparing with reference data.	Determination of melting point (quiz and unknown).	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
3rd	2	Determine the boiling point of a known liquid and correlate it with molecular properties	Determination of boiling point (known sample).	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
4th	2	Estimate the identity of an unknown liquid by determining its boiling point accurately	Determination of boiling point (quiz and unknown).	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
5th	2	Purify a known solid compound using recrystallization and evaluate purification efficiency.	Re-crystallization (known sample).	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
6th	2	Purify and identify an unknown solid compound using appropriate recrystallization techniques.	Re-crystallization (quiz and unknown sample)	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
7th	2	Apply distillation	Distillation	• Whiteboard	- Short

		techniques to separate and purify known liquid mixtures	techniques (known samples).	• Projector (Data Show) + Practical application of the experiment	questions - Quiz - Experiment report
8th	2	Select and apply suitable distillation methods for the separation of unknown liquid mixtures.	Distillation techniques (quiz and unknown).	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
9th	2	Classify organic compounds based on their solubility behavior in different solvents.	Determination of solubility class (known sample).	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report
10th	2	Determine the solubility class of an unknown compound to aid in its identification	Determination of solubility class (quiz and unknown).	• Whiteboard • Projector (Data Show) + Practical application of the experiment	- Short questions - Quiz - Experiment report

Course Description Form

1. Course Name:
Organic chemistry III
2. Course Code:
226
3. Semester / Year:
2nd Class/ 2nd Semester
4. Description Preparation Date:
06 / 02 / 2026
5. Available Attendance Forms:
In-person
6. Number of Credit Hours (Total) / Number of Units (Total)
Total hours 45 **3 Theoretical + 2 Practical (4 Units)**
7. Course administrator's name (mention all, if more than one name)
Name: Dr.Farah Jameel hasan **Email: chemfrh.mu.edu.iq**
8. Course Objectives

Course Objectives	**This course builds upon foundational organic chemistry principles to explore the chemistry of more complex and biologically significant molecules.** **The curriculum is centered on two major themes: the reactivity of oxygen– and nitrogen–containing functional groups (especially carbonyls) and an introduction to the vast and important field of heterocyclic chemistry.**

9. Teaching and Learning Strategies

Strategy	Interactive lectures, linking theory with laboratory and pharmaceuti applications, use of modern educational tools, and continuc assessment.

10. Course Structure

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

1st-3rd	10	Using the smart screen • Comprehensive lecture PDF file • Explanation using a white image	Heterocyclic system	Common structural types of heterocycles. Nomenclature of heterocyclic compounds..	• Short oral questions • Short quiz • Homework
4th- 5 th	5	Using the smart screen • Comprehensive lecture PDF file • Explanation usi a white image	Five-membered aromatic heterocycles	Structure of pyrrole, furan, and thiophene Source of pyrrole, fura and thiophene Electrophilic substitution in pyrro furan, and thiophene.	Discussion on the topic • Oral questions • Homework
6th – 7th	7	Using the smart screen • Comprehensive lecture PDF file • Explanation usi a white image	Non-aromatic heterocycles	Saturated five-membered heterocycles pyrrolidine, tetrahydrofuran, tetrahydrothiophen.	Short oral questions • Daily quiz • Homework
8 th-9 th	6	Using the smart screen • Comprehensive lecture PDF file • Explanation using a white image	Six-membered aromatic heterocycles	Structure of pyridine. Source of pyridine compounds. Reactions of pyridine. Electrophilic substitution in pyridi Nucleophilic substitution in pyridi Basicity of pyridine. Reduction of pyridine	• Short oral questions • Clarifying discussion

10th-13th	12	Using the smart screen • Comprehensive lecture PDF file • Explanation using a white image	Small heterocyc rings (epoxides)	Synthesis of epoxides Reactions of epoxides	• Class discussion • Daily quiz
14th-15th	5	Using the smart screen • Comprehensive lecture PDF file • Explanation using a white image	Fused ring heterocycles.	Quinoline and isoquinoline (benzopyridines) General properties o benzopyridines. Synthesis of benzopyridines. Indole (benzo[b]pyrrole). General properties o indole. Synthesis of indole.	• Short oral questions • Short quiz • Homework

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

40% coursework (20% midterm exam grade, 20% daily preparation, daily and oral quizzes, and classroom activities) and 60% final exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1) Organic Chemistry: by John McMurry 10th Ed, 2023 2) Organic Chemistry: Structure and Function (8th Edition) by Vollhardt and Schore. 3) Essentials of Organic Chemistry_ For Students of Pharmacy, Medicinal Chemistry, Biological Chemistry; Paul M Dewick
Main references (sources)	
Recommended books and references (scientific journals, reports…)	• Journals for Medical Science

	• pubcem
Electronic References, Websites	https://www.usp.org https://www.pharmacopoeia.com https://www.ich.org/page/quality-

Course Description Form

1. Course Name:	
Organic Pharmaceutical Chemistry	
2. Course Code:	
50302307	
3. Semester / Year:	
3rd Class, 2nd semester	
4. Description Preparation Date:	
6-2-2026	
5. Available Attendance Forms:	
Full-time students	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3h. Theory+1 h. practical/ 4h	
7. Course administrator's name (mention all, if more than one name)	
Name: Tammar Hussein Ali Email: tammar@mu.edu.iq	
8. Course Objectives	
Course Objectives	1. To enable understanding of mechanisms of drug action at the molecular level, the role of medicinal chemistry in the discovery and development of synth therapeutic agents. 2. It also enables students to understand the concept of the structure-act relationship and its application in the design and synthesis of new compounds derivatives.
9. Teaching and Learning Strategies	
Strategy	1. Active participation by engaging actively in lectures and discussions. 2. Effective time management by creating a study schedule. 3. Utilize resources. 4. Collaborative learning from study groups. 5. Hands-on experience by taking advantage of laboratory sessions. 6. Regularly review previous topics to ensure retention of information.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	3	Acid-base properties	Acid dissociation constant (Ka); pKa; Ionization	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
2nd	3	Drug distribution	Absorption; Distribution; Metabolism; Elimination	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
3rd	3	Statistical prediction of pharmacological activity	Computer old method in drug design.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
4th	3	QSAR models Molecular modeling	New method in drug desig Computer-aided drug desi	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
5th	3	Drug receptor interactior	bonding force involved in binding; Drug-receptor interaction and subsequer events	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
6th	3	Steric features of drugs. Optical isomerism and biological activity.	Geometric isomers. Optical configurational isomers.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
7th	3	Calculated conformation Three-dimensional quantitative structure-activity relationships and databases. Isosterism	Calculated conformation Stereochemistry of drug Isosterism	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
8th	3	General pathways of drug metabolism	Sites of drug biotransformation	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
9th	3	General pathways of drug metabolism	Role of cytochrome P450 mono-oxygenases in oxidative biotransformati	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz

10th	3	General pathways of drug metabolism	Oxidative reactions	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
11th	3	General pathways of drug metabolism	Reductive reactions	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
12th	3	General pathways of drug metabolism	Hydrolytic reactions	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
13th	3	General pathways of drug metabolism	Phase II reactions	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
14th	3	Factors affecting drug metabolism.	Factors affecting drug metabolism.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
15th		Exam	Exam		

11. Course Evaluation

Midpoints are 40 come from:

1. 15 points theory exam + 5 points for quizzes, and presentations.
2. 10 points as practical exam + 5 points for quizzes, 5 points for reports, and attendance.

The final point is 60 comes from the theory final exam.
The Total points of evaluation is 100.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. Wilson and Gisvold Textbook of Organic medicinal and Pharmaceutical chemistry, Delgado JN, Remers WA, (Eds); 10th ed, 2004
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Organic Pharmaceutical Chemistry (III)
2. Course Code:
427
3. Semester / Year:
4th Class/ 2nd Semester
4. Description Preparation Date: 20/2/2024
2026-2-6
5. Available Attendance Forms:
Full-time students
6. Number of Credit Hours (Total) / Number of Units (Total)
3h. Theory+1 h. practical/ 4h
7. Course administrator's name (mention all, if more than one name)
Name: Tammar H. Ali Email: tammar@mu.edu.iq
8. Course Objectives

Course Objectives	1. To the discovery and development of new agents for treating diseases and enab the translating of the drug structural formula into therapeutic effect. 2. It focuses on the methods of preparation for some pharmaceutical agents.
9. Teaching and Learning Strategies	
Strategy	1. Active participation by engaging actively in lectures and discussions. 2. Effective time management by creating a study schedule. 3. Utilize resources. 4. Collaborative learning from study groups. 5. Hands-on experience by taking advantage of laboratory sessions. 6. Regularly review previous topics to ensure retention of information.

10. Course Structure

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

1st	3	Anticancer	Anti-neoplastic agents; Alkylating agents.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
2nd	3	Anticancer	Antimetabolites.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
3rd	3	Anticancer	Antibiotics.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
4th	3	Anticancer	Plant products.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
5th	3	Anticancer	Miscellaneous compounds	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
6th	3	Hormones and Monoclon for cancer	Hormones and related compounds; Future anti-neoplastic agents.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
7th	3	Hormones and Monoclon for cancer	Monoclonal antibodies; Ge therapy of cancer.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
8th	3	Antibiotics	β-Lactam antibiotics (Penicillins).	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
9th	3	Antibiotics	β-Lactamase inhibitors.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
10th	3	Antibiotics	Cephalosporins and Monobactams.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz

11th	3	Antibiotics	Aminoglycosides and Chloramphenicol; Tetracyclines. Macrolides; Lincomycins a Polypeptides.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
12th	3	Antibiotics	Sulfonamides (chemistry, nomenclature, mechanism of action, resistance, toxicity, side effects, metabolism, protein binding, distribution and SAR); products; Sulfones.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
13th	3	Antivirals	Agents Inhibiting Virus Attachment, Penetration, a Early; Agents Interfering with Viral Nucleic Acid Replication; HIV Protease Inhibitors; HIV Reverse Transcriptase Inhibitors; I Integrase Inhibitors; Investigational Antiviral Agents	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
14th	3	Antifungals	Biochemical targets for antifungal chemotherapy; Polyene Membrane Disruptors; Ergosterol Biosynthesis Inhibitors; Inhibitors of Cell Wall Biosynthesis—Echinocandins; miscellaneous drugs.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
15th		Exam	Exam		

11. Course Evaluation

Midpoints are 40 come from:

1. 15 points theory exam + 5 points for quizzes, and presentations.
2. 10 points as practical exam + 5 points for quizzes, 5 points for reports, and attendance.

The final point is 60 comes from the theory final exam.
The Total points of evaluation is 100.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. Wilson and Gisvold Textbook of Organic medicinal and Pharmaceutical chemistry, Delgado JN, Remers WA, (Eds); 10th ed, 2004
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Advanced pharmaceutical Analysis
2. Course Code:
5210
3. Semester / Year:
5th Class/ 2nd Semester
4. Description Preparation Date:
6-2-2026
5. Available Attendance Forms:
Full-time students
6. Number of Credit Hours (Total) / Number of Units (Total)
3h. Theory+1 h. practical/ 4 h
7. Course administrator's name (mention all, if more than one name)
Name: Tammar H. Ali Email: tammar@mu.edu.iq
8. Course Objectives

Course Objectives	1. Studying spectrometric methods used for the identification and characterization of organic compounds, including UV, IR, MASS, and NMR spectroscopy. 2. To enable students to understand the applications of these techniques for qualitative and quantitative analysis of organic compounds.
9. Teaching and Learning Strategies	
Strategy	1. Active participation by engaging actively in lectures and discussions. 2. Effective time management by creating a study schedule. 3. Utilize resources. 4. Collaborative learning from study groups. 5. Hands-on experience by taking advantage of laboratory sessions. 6. Regularly review previous topics to ensure retention of information.

10. Course Structure

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

1st	3	UV/visible spectroscopy system	UV/visible spectroscopy; Sample handling and instrumentation; Characteristic absorption of organic compounds.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
2nd	3	UV/visible spectroscopy system	Rules for calculation of lambda max and application; Application of UV/visible; spectroscopy; Problems and solutions.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
3rd	3	Infra-red spectroscopy system	Infra-red spectroscopy (theory and H-bonding effect).	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
4th	3	Infra-red spectroscopy system	Sampling techniques and interpretation of spectra.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
5th	3	Infra-red spectroscopy system	Characteristic group frequencies of organic compounds.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
6th	3	Infra-red spectroscopy system	Application of IR spectroscopy; Problems and solutions.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
7th	3	Nucleomagnetic Resonance (NMR) system	Introduction of H1–Nucleomagnetic Resonance (NMR) and C13-NMR spectroscopy; The nature of NMR absorption; Chemical shifts; Factors affecting them.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
8th	3	Nucleomagnetic Resonance (NMR) system	Information obtained from NMR spectra, more complex spin-spin splitting patterns.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
9th	3	Nucleomagnetic Resonance (NMR) system	Application of H^1-NMR spectroscopy; C^{13}-NMR spectroscopy: introduction and characteristics.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz

10th	3	Nucleomagnetic Resonance (NMR) system	DEPT C^{13}- NMR spectroscopy.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
11th	3	Mass spectroscopy system	Introduction and interpreting Mass spectra.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
12th	3	Mass spectroscopy system	Interpreting Mass spectra fragmentation patterns.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
13th	3	Mass spectroscopy system	Mass behavior of some common functional groups.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
14th	3	Elemental microanalysis CHNSO	Elemental microanalysis CHNSO	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
15th		Exam	Exam		

11. Course Evaluation

Midpoints are 40 come from:

1. 15 points theory exam + 5 points for quizzes, and presentations.
2. 10 points as practical exam + 5 points for quizzes, 5 points for reports, and attendance.

The final point is 60 comes from the theory final exam.
The Total points of evaluation is 100.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. Spectrometric Identification of Organic Compounds by Silverstein, Bassler, and Morrill 2. Applications of absorption spectroscopy of organic compounds by Dyer JR. 3. Organic Chemistry by McMurry; 5thed; Thomason learning CA, USA 2000.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Medical terminology
2. Course Code:
116
3. Semester / Year:
The first semester/1st year
4. Description Preparation Date:
20 – 1 – 2026
5. Available Attendance Forms:
Attendance in class
6. Number of Credit Hours (Total) / Number of Units (Total)
1 hours per week (1 theoretical hours) / 1 units
7. Course administrator's name (mention all, if more than one name)
Name: Assist. prof. Ahmed Adeeb Mohamed Email: ahmedadeeb57@mu.edu.iq
8. Course Objectives

Course Objectives	**In this course, students will learn to pronounce, spell, and define medical and pharmaceutical terms used in health care settings. It will use a word–building strategy that helps them discover connections and relationships among word roots, prefixes, and suffixes**

9. Teaching and Learning Strategies

Strategy	They will learn the meaning of each part of a complex medical a pharmaceutical term and be able to put the parts together and defi the term.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Basic word roots and comm suffixes	Basic word roots and comm suffixes	White board, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-t exam, daily and exams
2	1	More word roots, suffixes prefixes related pharmaceutical sciences1	More word roots, suffixes prefixes related pharmaceutical sciences1		
3	1	More word roots, suffixes prefixes related	More word roots, suffixes prefixes related		

		pharmaceutical sciences2	pharmaceutical sciences2		
4	1	Basic anatomical terms abnormal conditions	anatomical terms		
5	1	Male and female ge medical terms	The genitals and urinary tra		
6	1	Oral cavity and digestive t	The gastrointestinal tract		
7	1	The heart and condit problems	The heart and cardiovasc system		
8	1	Symptoms, diagno treatments, communica qualifiers, and statistics	Symptoms, diagno treatments, communica qualifiers, and statistics		
9	1	Growth and development, body orientation	Growth and development, body orientation		
10	1	Gynecology, pregnancy childbirth	Gynecology, pregnancy childbirth		
11	1	The eye and the respira tract	The eye and the respira tract		
12	1	The nervous system behavioral disorders1	The nervous system		
13	1	The nervous system behavioral disorders2	The nervous system2		
14	1	Blood and immunity	Blood and immunity		
15					

11. Course Evaluation

Distributing the score out of 100 according to 30% midterm exam, the tasks assigned to the student such as daily preparation, daily oral, monthly, reports .... etc + 70% final exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Edward CC, (Ed.); A Short Course in Medical Terminology; 1st Ed.
Main references (sources)	Edward CC, (Ed.); A Short Course in Medical Terminology; 1st Ed.
Recommended books and references (scientific journals, reports…)	Edward CC, (Ed.); A Short Course in Medical Terminology; 1st Ed.; Lippincott Williams and Wilkins; 2008.
Electronic References, Websites	https://scholar.google.com

Course Description Form

1. Course Name:
Physiology I
2. Course Code:
3. Semester / Year:
2nd Semester, 1st year
4. Description Preparation Date:
28 / 2 / 2026
5. Available Attendance Forms:
Attendance in class
6. Number of Credit Hours (Total) / Number of Units (Total)
5 hours per week (3 theoretical hours and 2 practical hours) / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Amer Khazal Jaber Al Hasan Email: amer.khazal@mu.edu.iq
8. Course Objectives

Course Objectives	1) To learn the principle of human physiology and the body organized. 2) To learn the cell structure, functions, and signaling 3) To learn how the nervous system works
9. Teaching and Learning Strategies	
Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	3	Introduction	Introduction physiology: How is the body organized?	Interactive Screen video, pictures, diagrams, word lectures	Final exam, mid-term exam, and oral exams (weekly Reports)
2	3	Organ Systems Cavities Cellular level control	Introduction physiology: How is the body organized?	=	=
3	3	Temperature Regulation Hemostasis Energy reactions Metabolism	Homeostasis: Framework for Human Physiology	=	=
4	3	Transport pathways through the cell membrane	Cellular structure protein, and metabolic pathways	=	=
5	3	Cell Membrane Ion Channels Integral, External proteins	Cellular structure protein, and metabolic pathways	=	=
6	3	Filtration fraction, Mechanisms reabsorption and secretion, Na+ Reabsorption, Glucose reabsorption,	Movement Molecules across Cell Membranes	=	=

7	3	Diffusion Facilitated, Passive Active	Movement Molecules across Cell Membranes	=	=
8	3	Ligand gated Pinocytosis Phagocytosis	Movement Molecules across Cell Membranes	=	=
9	3	Sensory Recepto Modality of Sensation, Adaptation of receptors	Cell signaling physiology	=	=
10	3	Glial cells or Neuroglia, Excitation and conduction, Neurotrophins,	Cell signaling physiology	=	=
11	3	Classification of Nerve Fibers according to thei velocities, Temporal summation and Spatial summatic	Neuronal signaling and the structure of the nervous system	=	=
12	3	Physiological anatomy of the synapse, Presynaptic Inhibition,	Neuronal signaling and the structure of the nervous system	=	=
13	3	postsynaptic inhibition, Some special characteristics of synaptic transmission	Neuronal signaling and the structure of the nervous system	=	=

14	3	Brain Cortex Mid brain Medulla Oblongata cerebellum	Sensory physiology	=	=
15	3	Thalamus Hypothalamus Caudate Nucleus Higher centers Memory	Sensory physiology	=	=

11. Course Evaluation

20% mid-term exam score,
practical 20% (which include daily preparation, daily and oral exams, and classroom activities)
60% final exam score
Total score of 100

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Vander's Human physiology: the mechanisms of body function. Eric P. Widmaier, Hershel Raff, Kevin T. Strang, last edition
Main references (sources)	Ganong W.F (Ed.); 2005. and Textbo of Medical Physiology by Guyton AC; latest edition
Recommended books and references (scientific journals, reports…)	CL Ghai - A Textbook of Practi Physiology, 8th Edition Textbook of Medical Physiolog Guyton-2006- 11th.
Electronic References, Websites	https://scholar.google.com

1. Course Name:
Physiology I
2. Course Code:
214
3. Semester / Year:
The first / Second stage
4. Description Preparation Date:
2026\2\17
5. Available Attendance Forms:
Attendance in class
6. Number of Credit Hours (Total) / Number of Units (Total)
5 hours per week (3 theoretical hours and 2 practical hours) / 4 units
7. Course administrator's name
Name: Prof. Dr. Ali Mousa Rasheed Email: ali-alyasari@mu.edu.iq
8. Course Objectives

Course Objectives	o To enable students understanding the basic principles of physiological functions of different tissues and organs of the human being, o How to evaluate these functions and correlate them with the normal and abnormal conditions. o It also emphasizes on the role of homeostatic and hemodynamic changes in the integration of physiological status.

9. Teaching and Learning Strategies	
Strategy	o Cooperative education strategy. o Teaching strategy brainstorming. o Education strategy one minute paper. o Education strategy real time feedback o Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	3	Introduction	Introduction to physiology; Body composition, Membranous structures of the cell	Blackboard, video, pictures, diagrams, word lecture	Final exam, mid-term exam, and oral exams
2.	3	Transport pathways through the cell membrane	Passive transport	=	=

3.	3	Transport pathways through the cell membrane	Active transport	=	=
4.	3	Physiology of Nervous System	Divisions of the nervous system, Neural synapses, Central nervous system synapses,	=	=
5.	3	Physiology of Nervous System	Physiological anatomy of the synapse, Presynaptic Inhibition, postsynaptic inhibition, Some special characteristics of synaptic transmission	=	=
6.	3	Physiology of Nervous System	Glial cells or Neuroglia, Excitation and conduction, Neurotrophins, Sensory Receptors, Modality of Sensation, Adaptation of receptors	=	=
7.	3	Physiology of Nervous System	Nerve fiber types and function, General Classification of Nerve Fibers according to their velocities, Temporal summation and Spatial summation	=	=
8.	3	Physiology of muscle System	Muscles, Physiological anatomy of skeletal muscle, Molecular mechanism of muscle contraction, Characteristics of whole muscle	=	=

			contraction, Excitation - contraction coupling.		
9.	3	Physiology of muscle System	Excitation and Contraction of Smooth Muscle, Electrical and Mechanical Activity, Molecular Basis of Contraction, Chemical mediators in Contraction, Function of the nerve supply to smooth muscle	=	=
10.	3	Respiratory Physiology	Anatomy of the respiratory system, Mechanics of pulmonary ventilation, Pressures that cause the movement of air in and out of the lungs, Elastance, Compliance of the Lungs, Surfactant, "Work" of Breathing, Spirometry, Pulmonary Volumes, Pulmonary Capacities, Dead space	=	=
11.	3	Renal Physiology	Renal functions, Functional anatomy __ the nephron, Innervation of the renal vessels, Renal blood flow, Pressure in renal vessels, Regulation of the renal blood flow.	=	=
12.	3	Renal Physiology	Glomerular filtration Factors affecting the GFR, Filtration	=	=

			fraction, Mechanisms of tubular reabsorption and secretion, Na^+ Reabsorption, Glucose reabsorption,		
13.	3	Renal Physiology	Water excretion, The countercurrent mechanism, Osmotic diuresis, Proteinuria, Uremia, Acidosis, Micturition.	=	=
14.	3	Physiology of Cardiovascular	Cardiovascular system: origin and spread of cardiac excitation; the mechanical events of the cardiac cycle; cardiac output; cardiovascular regulatory mechanisms: Local regulatory mechanisms;.	=	=
15.	3	Physiology of Cardiovascular	systemic regulation by the nervous system; systemic regulation by hormones; Coronary circulation; Hypertension; Heart failure; Angina pectoris	=	=

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 40% striving (20% mid-term exam score, daily preparation, 20% practical exam, daily and oral exams, and classroom activities) 60% final exam score	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Review of Medical Physiology; Ganong W.F (Ed.); 2005. and Textbook of

	Medical Physiology by Guyton AC; latest edition.
Main references (sources)	Ganong W.F (Ed.); 2005. and Textbook of Medi Physiology by Guyton AC; latest edition.
Recommended books and references (scientific journals, reports...)	Ganong W.F (Ed.); 2005. and Textbook of Medi Physiology by Guyton AC; latest edition.
Electronic References, Websites	https://scholar.google.com/

1. Course Name:
Physiology II
2. Course Code:
229
3. Semester / Year:
The second / Second stage
4. Description Preparation Date:
2026\2\16
5. Available Attendance Forms:
Attendance in class
6. Number of Credit Hours (Total) / Number of Units (Total)
5 hours per week (3 theoretical hours and 2 practical hours) / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Ali Mousa Rasheed Email: ali-alyasari@mu.edu.iq
8. Course Objectives

Course Objectives	• To enable students understanding the basic principles of physiological functions of different tissues and organs of the human being, • How to evaluate these functions and correlate them with the normal and abnormal conditions. • It also emphasizes on the role of homeostatic and hemodynamic changes in the integration of physiological status.
9. Teaching and Learning Strategies	
Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	3	Endocrinology	Introduction; energy balance, metabolism and nutrition	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	3	Endocrinology	The pituitary gland	=	=
3.	3	Endocrinology	The thyroid gland	=	=
4.	3	Endocrinology	The gonads: development and function of the	=	=

			reproductive system		
5.	3	Endocrinology	The adrenal medulla and adrenal cortex gland	=	=
6.	3	Endocrinology	Hormonal control of calcium metabolism and the physiology of the bone	=	=
7.	3	Endocrinology	Endocrine functions of the pancreas and regulation of carbohydrate metabolism.	=	=
8.	3	Gastrointestinal function	Digestion and absorption of carbohydrates; proteins; lipids ; absorption of water and electrolytes; vitamins and minerals	=	=
9.	3	Gastrointestinal function	Regulation of gastrointestinal function: Introduction; gastrointestinal hormones; mouth and esophagus; stomach;	=	=
10.	3	Gastrointestinal function	Exocrine portion of the pancreas; liver and biliary system; small intestine; colon.	=	=
11.	3	Circulatory body fluid	Blood; bone marrow; white blood cells; immunity;	=	=
12.	3	Circulatory body fluid	Platelets; red blood cells; anemia; polycythemia	=	=
13.	3	Circulatory body fluid	blood group and Rh factor; hemostasis: The clotting mechanism / blood coagulation tests	=	=
14.	3	Circulatory body fluid	Anti-clotting mechanism;	=	=

15.	3	Circulatory body fluid	The plasma; the lymph; abnormalities of hemostasis.	=	=

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 40% striving (20% mid-term exam score, daily preparation, 20% practical exam, daily and oral exams, and classroom activities) 60% final exam score	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	The unified evaluative curriculum for colleges of pharmacy in Iraq
Main references (sources)	Ganong W.F (Ed.); 2005. and Textbook of Medi Physiology by Guyton AC; latest edition.
Recommended books and references (scientific journals, reports...)	Ganong W.F (Ed.); 2005. and Textbook of Medi Physiology by Guyton AC; latest edition.
Electronic References, Websites	https://scholar.google.com/

Course Description Form

1. Course Name:
Pharmacology I
2. Course Code:
327
3. Semester / Year:
Second semester/3rd year
4. Description Preparation Date:
2026/2/18
5. Available Attendance Forms:
Attendance in class
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours weekly/3 units
7. Course administrator's name (mention all, if more than one name)
Name: Rafat Abdulhassan Mohammed Jawad zainab abdlkadhim Email: rafat.abdulhassan@mu.edu.iq zainab.abdlkadhim@mu.edu.iq

8. Course Objectives	
Course Objectives	• **To introduce the pharmacy students to the basis of general pharmacology.** • **The student will learn about various body systems and drugs used to affect them in health and disease.** • **Moreover the course will cover the drugs used to treat microbial infections.**

9. Teaching and Learning Strategies	
Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy from reading and analyze a scientific paper. • Education strategy using the feedback and response to it. • Education strategy from note taking and response to it.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Remembering, understanding, applying, analyzing, evaluating and other knowledge, skills and values that the student acquires during the explanation of each topic of the curriculum that specified for the subject.	General introduction to Pharmacology Pharmacokinetics	Teaching and explanation during lectures, using data show to clarify the lectures, scientific discussions, homework, and informing the student about modern scientific sources.	Through daily and midterm exam, in addition to scientific discussions and other scientific activities.
2	3		Pharmacokinetics		
3	3		Drug-receptor interaction and pharmacodynamics		
4	3		The autonomic nervous system (ANS); and cholinergic agonist		
5	3		Cholinergic antagonist		
6	3		Adrenergic agonist		
7	3		Adrenergic antagonist		
8	3		Principal of antimicrobial therapy		
9	3		and cell wall inhibitor		
10	3		Protein synthesis inhibitors		
11	3		Quinolones, Folate antagonists, and urinary tract antiseptics		
12	3		Antimycobacterim drugs		
13	3		Antifungal drugs		
14	3		Antiprotozoal drugs		
15	3		Anthelmintic drug		

11. Course Evaluation

5 marks Quizzes and scientific activities and attendance+ 25 marks Midterm exam+ 70 marks Final exam.

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	المنهج الموحد للامتحان التقويمي لكليات الصيدلة للعام الدراسي Lipincott Pharmacology 7th Edition
Main references (sources)	Lippincott's illustrated reviews pharmacology (different editions and for up-to-date years).
Recommended books and references (scientific journals, reports…)	Basic and clinical pharmacology Some other related references could be used in the lectures
Electronic References, Websites	Some other related references could be used in the lectures

Course Name: .1
General Toxicology
Course Code: .2
429
Semester / Year: .3
The second / 4th
Description Preparation Date: .4
14\2\2026
Available Attendance Forms: .5
Attendance in class
Number of Credit Hours (Total) / Number of Units (Total) .6
4 hours per week (2 theoretical hours and 2 practical hours) /3 units
Course administrator's name (mention all, if more than one name) .7
Name: Dr. Zainab Sattar Ali Email: zainbsatarali@mu.edu.iq
Course Objectives .8

Course Objectives	• To study the principle of exposure to different chemicals and environmental factors, their sources, mechanisms of toxicity and their risk to human being; • It enables students to understand the required measures to protect living organisms against the suspected toxic hazards.
Teaching and Learning Strategies .9	
Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

Course Structure .10

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
.1	2	Introduction General Toxicology	general consideration; host factor,	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams

.2	2	Introduction General Toxicology	environmental factors of toxic effects.	=	=
.3	2	Carcinogenesis.	Carcinogenesis.	=	=
.4	2	Mutagenesis	Mutagenesis	=	=
.5	2	Target organs and systemic toxicology	Respiratory system	=	=
.6	2	get organs and systemic toxicology	Liver	=	=
.7	2	get organs and systemic toxicology	Kidney	=	=
.8	2	Target organs and systemic toxicology	Skin	=	=
.9	2	Target organs and systemic toxicology	Nervous system	=	=
.10	2	Target organs and systemic toxicology	cardiovascular system,	=	=
.11	2	Target organs and systemic toxicology	Blood	=	=
.12	2	Toxic substances	Food additive and contaminants, Pesticides,	=	=
.13	2	Toxic substances	Metals, Radiation and radio active materials	=	=
.14	2	Toxic substances	plants, Solvent	=	=
.15	2	Environmental toxicology	Air pollution, water and soil pollutants, Gases (Tear gas, Pepper spray), CO, Cyanide(H2S).	=	=

Course Evaluation .11
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 40% striving (20% mid-term exam score, daily preparation, 20% practical exam, daily and oral exams, and classroom activities) 60% final exam score

Learning and Teaching Resources .12	
Required textbooks (curricular books, if any)	Casarett and Doull, Toxicology
Main references (sources)	Casarett and Doull, Toxicology.
Recommended books and references (scientific journals, reports...)	The Basic Science of Poisons; latest edition.
Electronic References, Websites	https://scholar.google.com/

Course Description Form

1. Course Name:
Pharmacology II
2. Course Code:
411
3. Semester / Year:
First semester/4th year
4. Description Preparation Date:
2026/2/18
5. Available Attendance Forms:
Attendance in class
6. Number of Credit Hours (Total) / Number of Units (Total)
5 hours weekly including (3h theoretical + 2h practical) /4 units
7. Course administrator's name (mention all, if more than one name)
Name: Rafat Abdulhassan Mohammed Jawad Email: rafat.abdulhassan@mu.edu.iq
8. Course Objectives

Course Objectives	• **To introduce the pharmacy students to the general pharmacology of the central nervous system and to the various drug groups used in the treatment of CNS diseases or drugs altering its function.** • **The student will be introduced to the various drugs used in the management of cardiovascular diseases.** • **Moreover, the course will cover the drugs affecting the gastrointestinal and respiratory systems.**

9. Teaching and Learning Strategies

Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy from reading and analyze a scientific paper. • Education strategy using the feedback and response to it. • Education strategy from note taking and response to it.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Remembering, understanding, applying, analyzing, evaluating and other knowledge, skills and values that the student acquires during the explanation of each topic of the curriculum that specified for the subject.	Introduction to CNS pharmacology & CNS stimulants	Teaching and explanation during lectures, using data show to clarify the lectures, scientific discussions, homework, and informing the student about modern scientific sources.	Through daily and midterm exam, in addition to scientific discussions and other scientific activities.
2	3		Anxiolytic and Hypnotic drugs		
3	3		General and Local Anesthetics		
4	3		Antidepressant drugs		
5	3		Antipsychotic (neuroleptic) drugs		
6	3		Opioid analgesics and antagonists		
7	3		Treatment of neurodegenerative diseases		
8	3		Antiepileptic Drugs		
9	3		Diuretics& The treatment of heart failure (HF)		
10	3		Antiarrhythmic drugs & Antianginal Drugs		
11	3		Antihypertensive drugs		
12	3		Drugs affecting the blood		
13	3		Antihyperlipidemic drugs		

14	3		Gastrointestinal and antiemetic drugs		
15	3		Drugs acting on the respiratory system		

11. Course Evaluation

20 marks for the Practical part which includes Quizzes, attendance, exams, reports and other scientific activities+ 20 marks for the theoretical part that includes: Midterm exam+ attendance and other scientific activities+ 60 marks Final exam.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lipincott Pharmacology 7th Edition
Main references (sources)	Lippincott's illustrated reviews pharmacology (different editions and for up-to-date years).
Recommended books and references (scientific journals, reports…)	• Basic and clinical pharmacology • Some other related references could be used in the lectures
Electronic References, Websites	Some other related references could be used in the lectures

Course Description Form

1. Course Name:
Pharmacology III
2. Course Code:
426
3. Semester / Year:
Second semester/4th year
4. Description Preparation Date:
2026/2/18
5. Available Attendance Forms:
Attendance in class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours weekly/2 units
7. Course administrator's name (mention all, if more than one name)
Name: Rafat Abdulhassan Mohammed Jawad Email: rafat.abdulhassan@mu.edu.iq
8. Course Objectives

Course Objectives	• **To introduce the pharmacy students to various drug groups affecting endocrine systems and their use in correcting abnormalities in the endocrine functions.** • **Moreover, the course will cover the drugs used in the management of neoplastic diseases, bone disorders, and other diseases.** • **Inflammatory agents and the anti-inflammatory drugs will also be covered during this course.**

9. Teaching and Learning Strategies

Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy from reading and analyze a scientific paper. • Education strategy using the feedback and response to it. • Education strategy from note taking and response to it.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Remembering, understanding, applying, analyzing, evaluating and other knowledge, skills and values that the student acquires during the explanation of each topic of the curriculum that specified for the subject.	Anti-inflammatory, Antipyretic, and analgesic agents	Teaching and explanation during lectures, using data show to clarify the lectures, scientific discussions, homework, and informing the student about modern scientific sources.	Through daily and midterm exam, in addition to scientific discussions and other scientific activities.
2	2		Anti-inflammatory, Antipyretic, and analgesic agents		
3	2		Biological therapies in rheumatoid arthritis		
4	2		Other drugs for rheumatoid arthritis; Drugs employed in the treatment of gout		
5	2		Drugs affecting bone metabolism		
6	2		Insulin and oral hypoglycemic drugs		
7	2		Insulin and oral hypoglycemic drugs		
8	2		Hormones of the pituitary and thyroid glands		
9	2		Corticosteroids		
10	2		Estrogens and Androgens		
11	2		Estrogens and Androgens		

12	2		Principles of cancer chemotherapy		
13	2		Anticancer Drugs		
14	2		Anticancer Drugs		
15	2		Anticancer Drugs		

11. Course Evaluation

5 marks Quizzes and scientific activities and attendance+ 25 marks Midterm exam+ 70 marks Final exam.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	المنهج الموحد للامتحان التقويمي لكليات الصيدلة Lipincott Pharmacology 7th Edition
Main references (sources)	Lippincott's illustrated reviews pharmacology (different editions and for up-to-date years).
Recommended books and references (scientific journals, reports…)	• Basic and clinical pharmacology • Some other related references could be used in the lectures
Electronic References, Websites	Some other related references could be used in the lectures

1. Course Name:

Clinical Toxicology

2. Course Code:

516

3. Semester / Year:

The first / 5th year

4. Description Preparation Date:

2026/2/1

5. Available Attendance Forms:

Attendance in class

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

4 hours per week (2 theoretical hours and 2 practical hours) / 3 units

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

Name: : zainab abdlkadhim
Email: zainab.abdlkadhim@mu.edu.iq

8. Course Objectives

Course Objectives	• to provide students with the principles and skills required to deal with the toxicity of chemicals and drugs in clinical settings • To study the principle of exposure to different chemicals and environmental factors, their sources, mechanisms of toxicity and their risk to human being; • it enables students to correlate signs and symptoms of toxicity with the analytical data, and to know how to establish preventive and therapeutic measures for poisoning cases.

9. Teaching and Learning Strategies

Strategy	• Cooperative education strategy. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	2	Initial Evaluation and Management of general population, pediatric poisoning and geriatric patient	General Toxicology	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	2	Over the counter drugs; caffeine; theophylline.	Drug Toxicity	=	=
3.	2	Antihistamine, decongestant;	Drug Toxicity	=	=

		vitamins.			
4.	2	rdiovascular drugs; beta blockers; ACE nhibitors; Digoxin.	Prescription Medications	=	=
5.	2	Calcium channel blocker; Antiarrhythmic agents.	Prescription Medications	=	=
6.	2	hypoglycemic drugs	Prescription Medications	=	=
7.	2	Mid exam	----------	=	=
8.	2	Opiods; CNS anti-cholinergic phenothiazines	Prescription Medications	=	=
9.	2	Drug of Abuse	Opioids; Cocaine; phencyclidine.	=	=
10.	2	Drug of Abuse	marijuana; Lysergic acid.	=	=
11.	2	Chemical and Environmental Toxins	Hydrocarbons	=	=
12.	2	Chemical and Environmental Toxins.	Antiseptic; Disinfectants	=	=
13.	2	Chemical and Environmental Toxins	Camphor; moth repellents	=	=
14.	2	Botanicals and plants-derived toxins	Herbal preparation; Toxic plants	=	=
15.	2	Botanicals and plants-derived toxins	Poisonous mushrooms	=	=

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

40% striving (20% mid-term exam score, daily preparation, 20% practical exam, daily and oral exams, and classroom activities)

60% final exam score

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Gossel TA, Bricker TD, (Eds.); . Principles of Clinical Toxicology
Main references (sources)	Viccellio P, (Ed.); Handbook of Medicinal Toxicology
Recommended books and references (scientific journals, reports...)	The Basic Science of Poisons; latest edition.
Electronic References, Websites	https://scholar.google.com

1. Course Name:

Medical Physics

2. Course Code:

3. Semester / Year:

First Semester/ First year

4. Description Preparation Date:

2025\9\25

5. Available Attendance Forms:

In presence

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

5 hours per week (3 theoretical hours and 2 practical hours) / 4 units

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

Name: Lec. Dr. Ammar Mohammed Jaaz Alhasan
Email: ammar.physicist@mu.edu.iq

8. Course Objectives

Course Objectives	• The ability to deal with the concepts of physics, • Emphasizes the knowledge and skills required to efficiently discharge the duties and responsibilities of the pharmacist. • The course deals with the concept of basic physics and application of physics in the medical field. Upon completion of the course the students will be able to understand the physical terminology and abbreviation used to describe the lecture, and the application in medical field.

9. Teaching and Learning Strategies

Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute question. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	3	General concepts	Method of physics and standards	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	6	Pressure	temperature and temperature scales (Celsius, Fahrenheit, clauses equation and Vander Waales equation;	=	=

			equilibrium and types of equilibrium; compressibility factor, coefficient of volume expansion, elastic coefficient		
3.	3	Heat and energy	work and mechanical forms of work; power; the 1st law of thermodynamics; Boyles and Charles law; practice exercises.	=	=
4.	6	The 2nd law thermodynamics	reversible and irreversible process; entropy and enthalpy; internal energy; heat capacity and adiabatic process; the relation between pressure, volume, and temperature	=	=
5.	6	Fundamental of physics	Kinetic theory of a gas;electromagneti c waves; Maxwell equations; physical optics.	=	=
6.	3	Radiation	Kirshoffs law; planks law; Stefan-Boltzan law; Black body	=	=
7.	6	Radiation	Production of X-Ray and X-Ray spectra; absorption of X-Ray; U.V and IR effects; medical and biological effects of radiation; radiotherapy.	=	=
8.	6	Diagnoses	CT scan , MRI	=	=

			,Gamma Knife, Beta scan		

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 40% striving (20% mid-term exam score, 20% daily preparation, daily and oral exams, and classroom activities) 60% final exam score	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**Reference text: Physics for Biology and Medical Students, 2nd ed.**
Electronic References, Websites	**https://scholar.google.com**

Course description template

1. Course Name					
Biostatistics					
2. Course code					
3. Semester/Year					
First semester/ first year					
4. Date this description was prepared					
2025/11/16					
5. Available forms of attendance					
My presence					
6. units (total) Number of study hours (total) / Number of					
hours / Number of units: 2 hours/week 2 units					
7. .Name of the course coordinator (if there is more than one, please mention it)					
Name : Asst.L Mustafa Abd alkarim Abdullah Email: mustafa.abd@mu.edu.iq					
8. Course objectives					
• The course aims to teach the subject of biostatistics and .explain its terminology • Students apply the specifications table scientifically through .lectures • biostatistics in accurately It illustrates the need to use .assessing academic achievement					Course objectives
9. Teaching and learning strategies					
• Using discussion (educational dialogue) which relies on t .exchange of ideas to arrive at the facts • .Using modern teaching methods					strategy
10. Course structure					
Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
				4	1-2

scientific discussion	Lecture and discussion	Fundamentals of Biostatistics and Descriptive Statistics	The difference between biostatistics and descriptive statistics		
to prepare	Lecture and discussion	Integration and differentiation	Learning about derivation and migration in pharmaceutical fields	4	3-4
to prepare	Lecture and discussion	Applications of the area under the curve	Relationship between under the the area curve and drug kinetics	4	5-6
discussion and quiz	Lecture and discussion	Samples and confidence intervals	Determining the appropriate sample size and what the null and alternative .hypotheses are	3	7-8
Scientific report	Lecture and discussion	Dependent and independent variables	Understanding the relationships between dependent and independent variables	3	9
to prepare	Lecture and discussion	Correlation and regression	Understanding the difference between a sample and a standard value	3	10-11
a test	Lecture and discussion	Monthly test	Monthly test	3	12
to prepare	Lecture and discussion	of Analysis variance tests	Finding significant differences between groups	2	13
discussion	Lecture and discussion	Options in the field of abnormal distribution	-Parametric and non parametric tests	2	14

scientific discussion	Lecture and discussion	Correlation test for categorical variables	Understanding the relationship between variables categorical	2	15
15					
Monthly test 20	Extracurricular activities 10	Final exam grade 70			

11. Learning and teaching resources	
Nothing	Required textbooks (methodology, (applicable
Vital Statistics, by Michael R. Chernik	Main references (sources)
. Scientific journals that deal with biostatistics	Supporting books and references (…scientific journals, reports)
Nothing	Electronic references, websites

Course Specification Form

1- Course Title
Human rights and democracy .
2- Course Code .
Human Rights and Democracy .
3- Semester / Year.
First Semester, First year.
4- Date of Preparation.
March 3, 2026.
5- Available Attendance Modes.
In-person
6- Total Credit Hours / Total Units.
2 Hours / Total Units.2
7- Course Coordinator Name (Mention all names if more than one).
Name: Bayader Emad Sadiq Email: byadrmad52@gmail.com
8- Course Objectives.

Course Learning . Objectives	**1-Understanding fundamental principles such as: human dignity, equality, and non-discrimination.** **2- Developing the ability to analyze international legal texts.** **3- Preparing students with legal and human rights awareness, enabling them to defend their nts and the rights of others, and contributing to building a society governed by law and justice.**
9- Teaching and Learning Strategies	
Strategy	Explaining fundamental concepts (Dignity, Equality, Non-discrimination) resenting a hypothetical case of a specific rights violation (such as the right to education or a fair trial i viding students into groups to study topics such as Civil and Political Rights -A Economic, Social, and Cultural Rights -B

10- Course Structure

The Week	Credit Hours	Intended Learning Outcomes (ILOs)	Module or Topic Title	Learning Method	Assessment Method
.1The conce of Human Rights and th characteristi	2	**ideal approach to ning Human Rights is through a combination of understanding,**	**Human hts and mocracy**	**1- Definition of Human Rights and their - Essential Characteristics** **2-Identifying key international documents, including the Universal Declaration of Human**	

.2 The importance c Human Right and their typ .3 Types of Human Right in Islamic Sharia. .4 Types of Human Right in the Iraqi Constitution 2005. .5 The historical development Human Right .6 National general mechanisms Human Right .7 The conce of the International Bill of Humar Rights and its covenants. .8 Group-specific and special rights .9 National mechanisms and procedur for the implementat of rights. .10 Gross violations of Human Right .11 International Humanitaria Law and the protection of rights. .12 The Hum Rights Counc and its tasks. .13 Mechanisms		**ogue, analysis, and ctical application. his ensures that udents transition from mere morization to the bility to actively dvocate for and .defend rights lass Participation and Topical Discussions Short Quizzes for mative Assessment**	.	**Rights larifying the role of the United Nations (UN) in .promoting and protecting human**	

the Council's work. .14 The Universal Periodic Review (UPR mechanism i the Human Rights Counc .15 International and regional protection mechanisms Human Right and methods accountabilit					

11- Course Evaluation

Grade Distribution (Total: 100 Marks) Student Assigned Tasks Daily Preparation Daily Quizze Oral Examinations s Monthly Exams Written Midterm Exams Reports & Research Papers Final Examination.

12- Teaching and Learning Resources

Required Textbooks (Prescribed Curriculum, if any)	Required Textbook .Title: Human Rights and Democracy Author/Publisher: The Supreme Ministerial .Committee
Main References (Sources)	mocracy and Human Rights: Mohammed Abed al-Jabri
Recommended Supplementary References	Georges Democracy: A Synthetic Attempt Sami Nassar Burdeau
Electronic Resources and Websites	None

1. Course Name:
Arabic Language
2. Course Code:
3. Semester / Year:
Second Semester/ First year
4. Description Preparation Date:
2026/2/15
5. Available Attendance Forms:
Attendance lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours weekly / (2Units)
7. Course administrator's name (mention all, if more than one name)
Name: Ahlam Adnan Jabbar Email: ahlam.adnan@mu.edu.iq
8. Course Objectives

Course Objectives	**Preserving the identity of the Arabic language, developing students' grammatical linguistic abilities, correcting the melody resulting from a linguistic error in pronunciation, training in the proper application of Arabic language rules, and developing the student's linguistic abilities.**

9. Teaching and Learning Strategies	
Strategy	Using various means to deliver the material to the student, preparing lectures and presenting them during the lecture, discussion method, group participation, and student self-activity by collecting the information provided to be presented in the classroom.

10. Course Structure

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

1	2	Placing the student on t path of correct knowled of Quranic sciences and exploring meanings and values	Surah Al-Hajj	In-person lectures	Sumner daily activity, exam
2	2	The student's understanding of Islami teachings and doctrines and the development of religious attitude	The Noble Prophetic Hadith	In-person lectures	Sumner daily activity, exam
3	2	Developing linguistic an intellectual wealth by increasing vocabulary a styles	Verses from Ibn a Rumi's poem "Ba'iyyah"	In-person lectures	Sumner daily activity, exam
4	2	Because it is a fundamental entry poin for understanding Arab culture.	Human values in pre-Islamic poetry	In-person lectures participation and discussion	Sumner daily activity, exam
5	2	DUnderstanding the meanings of the Qur'an by referring to its vocabulary and its uses in poetry	Islam and poetry	In-person lectures participation and discussion	Sumner daily activity, exam
6	2	The students were able to distinguish between types words and correctly pronounce their endings.	Parts of speech ar their grammatical markers	In-person lectures participation and discussion	Sumner daily activity, exam
7	2	The difference between inflected words, whose endings change, and indeclinable words, whi remain in one form.	Inflected and indeclinable, defi and indefinite	In-person lectures participation and discussion	Sumner daily activity, exam
8	2	Understanding the nomin sentence and its compone	The beginner, the news, and the copyists	In-person lectures participation and discussion	Sumner daily activity, exam
9	2	Understanding and using rules	The subject and th passive subject	In-person lectures participation and discussion	Sumner daily activity, exam
10	2	Understanding the miraculous nature of the Quran and developing literary taste	Arabic rhetoric ar its relationship to the Arabic langua	In-person lectures participation and discussion	Sumner daily activity, exam

11	2	The ability to distinguish refined styles from crude ones	The science of rhetoric	In-person lectures participation and discussion	Sumner daily activity, exam
12	2	Understanding the sources o beauty in textual contexts an embellishing them with rhetorical devices.	Simile and metapl	In-person lectures participation and discussion	Sumner daily activity, exam
13	2	Distinguishing between th literal and figurative meanings of words and understanding rhetorical attribution.	Dliteral meaning, metaphor, metonymy, and mental imagery	In-person lectures participation and discussion	Sumner daily activity, exam
14	2	Correcting incorrect language practices and improving grammatical ar spelling proficiency	Common linguisti errors	In-person lectures participation and discussion	Sumner daily activity, exam
15		End-of-course exam	End-of-course exa	Attend the exam	Attend the exam

11. Course Evaluation

Grade distribution: (25) marks for the midterm exam (5) marks including daily participation, assignments, and attendance (70) marks for the final exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	nothing
Main references (sources)	The Holy Quran, its interpretation a explanation of its vocabulary by Al-Suyuti, Aqil's commentary on Ibn Malik's Alfiyya, Nahw Al-Wafi, Jami' Al-Durus by Mustafa Ghalayini, spelling and punctuation in Ara writing, the collected poems of Al-Sharif Al-Ra the collected poems of Abu Al-Ala' Al-Ma'arri, book Adab Al-Katib, a dictionary and guide to jurisprudence of language, and Sirr Al-Arabiy by Al-Tha'alibi
Recommended books and references (scientific journals, reports…)	Books on poetic text analysis

Electronic References, Websites	nothing

Course Description Form

1. Course Name
Computer Science I
2. Course Code
3. Semester/ Year
Second Semester/ First year
4. Date of Preparation of this Description
2026/3/1
5. Available Attendance Forms
Learning-E + Attendance in Classroom
6. (Total) Number of Units /(Total) Hours
5 Hours per Week Number of Units 3
7. (If more than one name, mention) Course Coordinator Name
Name: M. Barakat Saad Ibrahim Al-Ayimyli Email: barakat.alobaidiy@mu.edu.iq Name: M.M. Ali Tariq Abd Al-Hussein
8. Course Objectives

Course Objectives	
Providing students with basic concepts in computers and information technology **Developing thinking and problem solving skills using computers and hardware/software applications** **Enabling students to deal with basic operating systems and software** **Developing logical thinking and problem solving skills**	

9. Teaching and Learning Strategies	
Theoretical Lecture- Practical Application in the Laboratory- Solving Exercises and Problems- Assignments and Homework-	**Strategy**

10. Course Structure

Assessment Method	Learning Method	Unit/Topic Name	Hours	

Quiz -Midterm Exam -Practical Lab Exam	Theoretical Lecture -Practical Application Group Discussion	Introduction to Computer: Concepts o Hardware and Software with their components; Concept of Computing, Data and Information; Applications o Information Electronics and Communication Technology (IECT); Connecting input/output devices, and peripherals to CPU.	5 Hours	1
Quiz -Midterm Exam -Practical Lab Exam	- Theoretical Lecture -Practical Application Group Discussion	Computer Components: Computer Portions, Hardware Parts, I/O Units, Memory Types, Basic CPU Components, Computer Ports, Personal Computer (Features and Types).	5 Hours	
Quiz -Midterm Exam -Practical Lab Exam	Theoretical Lecture -Practical Application Group Discussion	Operating System and Graphical Use Interface (GUI): Operating System; Basics of Common Operating System The User Interface, Using Mouse Techniques; Use of Common Icons, Status Bar, Using Menu and Menu-selection, Concept of Folders and Directories, Opening and closing of different Windows; Creating Short cu for diagnosing and resolving	5 Hr	
Quiz -Midterm Exam -Practical Lab Exam	Theoretical Lecture -Practical Application Group Discussion	Word Processing: Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Tal handling; Spell check, language settir and thesaurus; Printing of word document. Hardware and Software Study: Understanding hardware components including CPU, RAM, storage device input/output devices. Software types including system software, applicatio software, programming languages, ar word processing applications. Introduction to Internet and Web Browsers: Computer networks Basic; LAN, WAN; Concept of Internet and Applications; connecting to internet; World Wide Web; Web Browsing software's, Search Engines; Understanding URL; Domain name; Address.	5	
Quiz -Midterm Exam	Theoretical Lecture	Communications and Emails: Basics of electronic mail; Getting	55	

-Practical Lab Exam	-Practical Application Group Discussion	an email account; Sending and receiving emails; Accessing sent emails; Using Emails; Document collaboration.		
Quiz -Midterm Exam -Practical Lab Exam	Theoretical Lecture -Practical Application Group Discussion	Spread Sheet: Basics of Spreadsheet; Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet.	55	
Quiz -Midterm Exam -Practical Lab Exam	Theoretical Lecture -Practical Application Group Discussion	Presentation Software: Basics of presentation software; Creating Presentation; Preparation and Presentation of Slides; Slide Show; Taking printouts of presentation / handouts.	5	
Quiz -Midterm Exam -Practical Lab Exam	Theoretical Lecture -Practical Application Group Discussion	Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues.	5	
Quiz -Midterm Exam -Practical Lab Exam	Theoretical Lecture -Practical Application Group Discussion	Comprehensive Review and Practical Assessment: Review of all topics covered during the semester; practical assessment exercises and problem-solving.	5	

11. Course Assessment

: Final Exam60: Midterm Exam 20 / Grade Practical Exam 10Grades Attendance and : Assignments10 Grades

12. Teaching and Learning Resources

Commerce Basics-E –Computer Basics Computer Hardware and Softwar Components, Assembly, and Application Word Processing with Microsoft Word: Step Guide-by-Step	(Curriculum if available) Required Textbooks
	(References) Main References
	Recommended Supporting Books and References (….Scientific Journals, Reports)

	Electronic References, Internet Websites

Course Description Form

1. Course Name:
Medical Microbiology I
2. Course Code:
212
3. Semester / Year:
First semester/ Second year
4. Description Preparation Date:
1/2/2025
5. Available Attendance Forms:
Full-time students
6. Number of Credit Hours (Total) / Number of Units (Total)
3h. Theory+2 h. practical/ 3+1
7. Course administrator's name (mention all, if more than one name)
Name: Assistant professor Dr. Taleb Fadhil Abbas Email: tlb-abbas77@mu.edu.iq
8. Course Objectives

Course Objectives	**1**.giving introduction to Undersand the role of microorganisms in diseases. 2-study bacteria, viruses, fungi,and parasites including their identification & classificat 3-host-pathogen interaction. 4- immune response to infections. 5-epidemiology of infectious diseases and diagnostic techniques.

9. Teaching and Learning Strategies

Strategy	1. Active participation by engaging actively in lectures and discussions. 2. Effective time management by creating study schedule. 3. Utilize resources. 4. Collaborative learning from study groups. 5. Hands-on experience by taking advantage of laboratory sessions. 6. Regular review previous topics to ensure retention of information.

10. Course Structure

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

1st	3	Demostrate comprehensive understanding of fundamental principles, Theories and concepts medical microbiology.	Introduction: Importance of microbiology, History microbiology	-Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
2nd	3	Identify and classify common pathogens, understand characteristics microorganisms.	Anatomy of bacteria: surf appendages, capsule, cell v of G+ve and G-ve bacteria Cytoplasmic membrane.	-Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
3ed	3	Analaze the epidemiolog Of infectious disea including the distributio Transmission, and Control measuers various populations.	Bacterial physiology: Physical and chemical growth determinate, growth and growth cur bacterial reproduction.	-Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
4th	3	Study microbial genetics .	Genetics: Definition, genetic, element, mutation (spontaneous, Gene transfer, transformat conjugation, and g transduction).	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
5th	3	Study sporulation sterilization procedures	RecombinantDNA biotechnology. Sporulation and germinati Sterilization (chemical physical Methods).	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
6th	3	Describe the structure Classifications replications mechanism of bacteria. Recognize the clinical manifestations and infections.	Staphylococci species	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
7th	3	Describe the structure Classifications replications mechanism of bacteria. Recognize the clinical manifestations infections.	Streptococcus species	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
8th	3	Describe the structure Classifications replications mechanism of bacteria. Recognize the clinical manifestations infections.	Aerobic Spore-forming bacteria Bacillus species (*B. anthracis*, *B. subtilis*, *B. cereus*).	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.

9th	3	Describe the structure Classifications replications mechanism of bacteria. Recognize the clinical manifestations infections.	*Clostridium perfring Clostridium tet Clostridium botulinun*	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
10th	3	Describe the structure Classifications replications mechanism of bacteria. Recognize the clinical manifestations infections.	*Corynebacterium diphther* *Propionibacterium acnes*, *Listeria*	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
11th	3	Describe the structure Classifications replications mechanism of bacteria. Recognize the clinical manifestations infections.	*Mycobacterium tuberculo M. leprae*	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
12th	3	Describe the structure Classifications replications mechanism of bacteria. Recognize the clinical manifestations infections.	Enterobacteriaceae: (*E. coli; Klebsiella spp*	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
13th	3	Describe the structure Classifications replications mechanism of bacteria. Recognize the clinical manifestations infections.	Enterobacteriaceae: *Citrobacter , Serratia*, *Salmonella*, *Shigella*)	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
14th	3	Describe the structure Classifications replications mechanism of bacteria. Recognize the clinical manifestations infections.	Vibrio, Pseudomonas, Helicobacter pylori, Neisseria spp., Brucella, Proteus,	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
15th	3	Exam	Exam		

11. Course Evaluation

Mid points is 40 come from: 18 points theory exam+ 2 points as quizzes, presentations.
10 points as practical exam+ 5 points quizzes+ 5 points reports
And attendance.
Final points is 60 come from: Theory final exam.
The Total points of evaluation is 100.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Medical Microbiology, seventeenth edition E .Jawetz, J.L. Melnick, E.A. Adel 1987
Main references (sources)	

Recommended books and references (scientific journals, reports…)	Principles of microbiology by Roland M.
Electronic References, Websites	

COURSE DESCRIPTION FORM

Course Information

1. Course Name	Computers
2. Course Code	—
3. Semester / Academic Year	Semester One (Second Year)
4. Date of Preparation	2025/9/1
5. Available Attendance Modes	Classroom Attendance + E-Learning (classroom)
6. Weekly Credit Hours / Units	5 hours per week (3 theoretical hours and 2 practical hours) — 3 units (total)
7. Course Coordinator	Name: M. Barakat Saad Ibrahim Al-Ayimyli Email: barakat.alobaidiy@mu.edu.iq Name: M.M. Ali Tariq Abd Al-Hussein

8. Course Objectives

Subject-Matter Objectives:

- To equip students with foundational knowledge of computers and to master information technology skills.
- To enable students to interact with operating systems and core software applications.
- To develop critical thinking skills for problem-solving using computers and artificial intelligence.
- To foster logical thinking skills for problem-solving.

9. Teaching & Learning Strategies

Strategy	Description
Theoretical Lecture	In-class instruction
Practical Application in Lab	Hands-on exercises
Discussion & Problem-Solving	Group discussions and exercises
Assignments & Homework	Take-home tasks

10. Course Structure

#	Hours	Unit / Topic Name				Teaching Method	Assessment Method
1	5 hrs	Security and Networking: What is a network? Types of networks. Basic network components. Network Security Basics. Understanding network threats. Network Troubleshooting.				- Theoretical Lecture - Practical Application - Group Discussion	- Short Quiz - Semester Exam - Lab Practical Exam
2	5 hrs	E-Commerce: Concepts of Electronic banking services including online banking, ATM and debit card services, Phone banking, SMS banking, electronic mail, Mobile banking.				- Theoretical Lecture - Practical Application - Group Discussion	- Short Quiz - Semester Exam - Lab Practical Exam
3	5 hrs	Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues.				- Theoretical Lecture - Practical Application - Group Discussion	- Short Quiz - Semester Exam - Lab Practical Exam
4	5 hrs	Introduction to AI: Definition of AI, History of AI, AI techniques and Approaches, Challenges and Ethical Considerations.				- Theoretical Lecture - Practical Application - Group Discussion	- Short Quiz - Semester Exam - Lab Practical Exam
5	5 hrs	AI in Our Daily Lives: AI in smartphones and virtual assistants like Siri or Google Assistant.				- Theoretical Lecture - Practical Application - Group Discussion	- Short Quiz - Semester Exam - Lab Practical Exam
6	5 hrs	Applications of AI: Education, Healthcare, Finance, Transportation, Marketing and Advertising.				- Theoretical Lecture - Practical Application - Group Discussion	- Short Quiz - Semester Exam - Lab Practical Exam
7	5 hrs	AI and Society: How AI affects social life, AI and international relations, AI and the future of humanity.				- Theoretical Lecture - Practical Application	- Short Quiz - Semester Exam

						- Group Discussion	- Lab Practical Exam
8	5 hrs	Ethical Challenges in AI: AI ethics, privacy and surveillance, the impact of AI on the job market.				- Theoretical Lecture - Practical Application - Group Discussion	- Short Quiz - Semester Exam - Lab Practical Exam
9	5 hrs	The Future of AI: Future trends in AI, recent research and emerging technologies.				- Theoretical Lecture - Practical Application - Group Discussion	- Short Quiz - Semester Exam - Lab Practical Exam

11. Course Assessment

Assessment Component	Grade Weight (%)
Final Exam	60%
Semester / Mid-term Exam	20%
Practical / Lab Exam	10%
Attendance & Assignments	10%

12. Learning & Teaching Sources

Required Textbooks (Curriculum — if available):
- Fundamentals of Artificial Intelligence and its Applications in Various Fields
- Life

Primary References (Sources):
- (blank)

Recommended Books & Supporting References (Scientific Journals, Reports…):
- (blank)

Electronic References & Websites:
- (blank)

Course Description Form

1. Course Name:	
Crimes of the Ba'ath Party	
2. Course Code:	
3. Semester / Year:	
First Semester / Second Stage	
4. Description Preparation Date:	
5. Available Attendance Forms:	
Face-to-face classes	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours per week	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Lecturer Adyan mzhar muhammad Email: adyan.law@mu.edu.iq	
8. Course Objectives	
Course Objectives	**Familiarity and knowledge of the crimes of Baath regime in Iraq and their vocabulary, a reviewing and confirming the documentation these crimes internationally and the m important judicial rulings related to the subje** **● . Historical understanding** **● Identifying the origin of the Arab Socia Baath Party and its intellectual and politi development.** **● Documenting violations** **● Study cases of political repression a arbitrary arrests.** **● Analysis of the crimes of genocide and forc displacement (such as the Anfal campaigns Iraq).** **Discussing the use of internationally prohibi weapons.**

	● Legal analysis **● Classification of crimes according international law (crimes against humanity, v crimes, genocide).** **● Understand the role of national a international courts in holding offici accountable.** **● Promoting human rights awareness** **● Establishing the concepts of human rights a transitional justice.** **● Promote a culture of accountability a impunity.** **● Critical thinking** **● Analyzing the political and media discou related to the period of the party's rule.** **● Assessing the impact of these crimes society and the state until today**
9. Teaching and Learning Strategies	
Strategy	1. Problem-based learning • Presenting a real case (e.g.: legal description of a particular incident) • Students are required to analyze it in accordance with international law • Enhances research and reasoning skills 2. Case Study • Analysis of a historically or legally specific case. • Discussion of the parties, evidence, and results. • Linking the theoretical aspect to practical application. 3. Brainstorming • Ask a central question: How do political crimes affect state-building? • Recording, then organizing and analyzing ideas. 4. Collaborative Learning Strategies • Working in groups • Dividing students into teams. • A team that documents events historically. • A team that analyzes legally. • A team that studies social impact. • Present the results and discuss them collectively. 5. Scientific debate • Discuss issues such as transitional justice and reconciliation. • Training students to present evidence-supported arguments.

	6: Strategies based on sources and research • Document analysis • Studying legal texts or human rights reports. • Training students to verify sources. 7. Research-based learning • Assigning students to prepare short research on a specific topic. • Documenting references according to a scientific method. 8. Calendar Strategies • Formative calendar • Short questions during the lecture. • Analytical work papers.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understanding crimes of the ba party	The concept crimes and th divisions	Lecture	exam
2	2	Understanding crimes of the ba party	Crimes of the Ba regime accord to documentation the Iraqi Supre Criminal Court L in 2005	Lecture	report
3	2	Understanding crimes of the ba party	Types international crimes	Lecture	report
4	2	Understanding crimes of the ba party	Decisions issued the Supre Criminal Court	Lecture	report
5	2	Understanding crimes of the ba party	Psychological crimes	Lecture	Class discussion
6	2	Understanding crimes of the ba party	Mechanisms psychological crimes	Lecture	exam

7	2	Understanding crimes of the ba party	Mechanisms psychological crimes	Lecture	Class discussion
8	2	Understanding crimes of the ba party	Effects psychological crimes	Lecture	Class discussion
9	2	Understanding crimes of the ba party	Social Crimes	Lecture	Class discussion
10	2	Understanding crimes of the ba party	The Baath regime's posit on religion	Lecture	report
11	2	Understanding crimes of the ba party	Violations of Ir laws	Lecture	exam
12	2	Understanding crimes of the ba party	Pictures of hum rights violati and crimes of authority	Lecture	report
13	2	Understanding crimes of the ba party	Some decisions political a military violati of the Baath regi	Lecture	exam
14	2	Understanding crimes of the ba party	Places of pris and detention the Baath regim	Lecture	exam
15	2	Understanding crimes of the ba party	Environmental Crimes of the Ba Regime in Iraq	Lecture	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

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	asser Al-Zayadi, Geography of Cri Principles and Foundations / Dar Al-Hasa Damascus / 2015. 2. Dr. Hussein Aliwi Nasser Al-Zayadi and Abbas Attia Al-Quraishi, Environmer Crimes during the Baathit Regime, Iraqi Cen for Documenting the Crimes of Extremism, Kafil Printing House, Karbala, 2023. 3- Jundi Abdul Malik, Criminal Encyclopec Part III, Arab Heritage Neighborhood, Bei 1990. 4- The Law on the Affairs and Protection Mass Graves No. (5) of 2006 and Instructions No. (1) of 2019, Iraq

Course Description Form

1. Course Name:
Medical Microbiologyll (Medical Virology, immunology, and Parasitology)
2. Course Code:
222
3. Semester / Year:
Second Semester/ second class
4. Description Preparation Date:
1/2/2026
5. Available Attendance Forms:
Full-time students
6. Number of Credit Hours (Total) / Number of Units (Total)
3h. Theory+2 h. practical/ 3+1
7. Course administrator's name (mention all, if more than one name)
Name: Assistant professor Dr. Taleb Fadhil Abbas Email: tlb-abbas77@mu.edu.iq
8. Course Objectives

Course Objectives	**1**.Understand the life cycles, morphology, and pathogenicity of various parasitic organis Identify common parasitic infections and their clinical manifestations. 2. Comprehend the structure, classification, and replication of viruses, and recognize The clinical significance of different viral infections. 3.Understand the principles of the immune systems and its components, explore The mechanism of innate and adaptive immunity, and discuss the role of immunology In disease.

9. Teaching and Learning Strategies

Strategy	1. Active participation by engaging actively in lectures and discussions. 2. Effective time management by creating study schedule. 3. Utilize resources. 4. Collaborative learning from study groups. 5. Hands-on experience by taking advantage of laboratory sessions. 6. Regular review previous topics to ensure retention of information.

10. Course Structure

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

1st	3	Identify and classify common parasite, understand epidemiology transmission of parasiti infections, and treatmer	Intestinal and tissue protozoa (Amoeba (pathogenic and non pathogenic), Balantidium Giardia, Trichomonas Chilomastix)	-Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
2nd	3	Identify and classify common parasite, understand epidemiology transmission of parasiti infections, and treatmer	Haemoflagellates: Leishma spp	-Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
3ed	3	Identify and classify common parasite, understand epidemiology transmission of parasiti infections, and treatmer	Haemoflagellates: Trypanosome spp.	-Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
4th	3	Identify and classify common parasite, understand epidemiology transmission of parasiti infections, and treatmer	Sporozoa:Malarial parasite human; Toxoplasma.	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
5th	3	Identify and classify common parasite, understand epidemiology transmission of parasiti infections, and treatmer	Helminthes: Classification, Cestodes (Hymenolepis nana, Taenia spp.), Echinococcus (Hydatid cyst). Hepaticflukes, Trematodes(Blood Flu Schistosoma spp).	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
6th	3	Identify and classify common parasite, understand epidemiology transmission of parasiti infections, and treatmer	Helminthes: Nematods: Ascaris, Entrobius. Trichuris, Ancylostoma, Necator americans.	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
7th	3	Describe the structure Classifications replications mechanism of viruses. Recognizethe clinical manifestations viral infections.	Virology: Introduction, Comparison between viruses and Bacteria and other microbes; origin of viruses, reproduction, one step growth curve, type of mutations and Classification of viruses	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
8th	3	Identify and classify common RNA viruses, underst the epidemiology transmission of viruses infections, and treatmer	Virology: RNA viruses: Orthomyxo viruses; Paramyxo viruses; Retro viruses; Hepato viruses; Oncogenic viruses	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with

					Qiuzes.
9th	3	Identify and classify common RNA viruses, underst the epidemiology transmission of viruses infections, and treatmer	Virology: DNA viruses: Herpes viridae; poxviradeae, adenoviredeae, parvoviruses	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams
10th	3	Explain the principles of The immune syst including innate adaptive immunity	Immunology: introduction,	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams
11th	3	Explain the principles of The immune syst including innate adaptive immunity	Immunology: innate adaptive immunity	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams
12th	3	Evaluate the role immunology in vari disease processes includ autoimmune diseases.	complement,MHC molec and autoimmune diseases	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
13th	3	Hypersensitivity reactio And immune rela therapies	hypersensitivity	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
14th	3	Evaluate the role immunology in various disease	tumor immunity, immunodeficiency, immunological methods	Active reading Teaxt books. -online resources -Self assessment - Reflection	Formative And Summative Evaluation (Mid = final) Exams with Qiuzes.
15th	3	Exam	Exam		

11. Course Evaluation

Mid points is 40 come from: 18 points theory exam+ 2 points as quizzes, presentations.
10 points as practical exam+ 5 points quizzes+ 5 points reports and attendance.
Final points is 60 come from: Theory final exam.
The Total points of evaluation is 100.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Animal Agents and Vectors of Human Disease. 5th.Ed. P.C. Beaver & R.C. Jung.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Medical Microbiology by Murry, Rosenthal, and Pfaller. Journal of parasitology Journal of Virology, and Journal of Immunology.
Electronic References, Websites	

1. Course Name:

Arabic Language

2. Course Code:

3. Semester / Year:

Second semester/Second year

4. Description Preparation Date:

2026/2/8

5. Available Attendance Forms:

Attendance lectures

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

2 hours weekly / (2Units)

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

Name: Ahlam Adnan Jabbar
Email: ahlam.adnan@mu.edu.iq

8. Course Objectives

Course Objectives	**Preserving the identity of the Arabic language, developing students' grammatical linguistic abilities, correcting the melody resulting from a linguistic error in pronunciation, training in the proper application of Arabic language rules, and developing the student's linguistic abilities.**

9. Teaching and Learning Strategies

Strategy	Using various means to deliver the material to the student, preparing lectures and presenting them during the lecture, discussion method, group participation, and student self-activity by collecting the information provided to be presented in the classroom.

10. Course Structure

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

1	2	Placing the student on t path of correct knowled of Quranic sciences and exploring meanings and values	Surah Yusuf	In-person lectures	Sumner daily activity, exam
2	2	The student's understanding of Islami teachings and doctrines and the development of religious attitude	The Noble Prophetic Hadith	In-person lectures	Sumner daily activity, exam
3	2	Developing linguistic an intellectual wealth by increasing vocabulary a styles	Verses from Al-Mutanabbi's poen Mimiyah	In-person lectures	Sumner daily activity, exam
4	2	Refining artistic and aesthetic taste and enriching their vocabula	A poem by Al-Jawahiri	In-person lectures participation and discussion	Sumner daily activity, exam
5	2	Understanding the structu of Arabic words to develo language skills	The noun in term gender (masculin and feminine)	In-person lectures participation and discussion	Sumner daily activity, exam
6	2	The ability to distinguish between root and extra letters in a word	The name in term abstraction and addition	In-person lectures participation and discussion	Sumner daily activity, exam
7	2	Knowing the appropriat formulas that suit different meanings	The noun in term singular, dual, and plural	In-person lectures participation and discussion	Sumner daily activity, exam
8	2	Understanding the rules o its use	Number and its ru	In-person lectures participation and discussion	Sumner daily activity, exam
9	2	Correcting the tongue fro melody	Followers	In-person lectures participation and discussion	Sumner daily activity, exam

10	2	he ability to distinguish refined styles from clumsy ones	The science of rhetoric and its impact on the eloquence of spee	In-person lectures participation and discussion	Sumner daily activity, exam
11	2	Understanding the source of beauty in textual contex and embellishing them wi rhetorical devices	Semantic embellishments include allusion, antithesis, and contrast.	In-person lectures participation and discussion	Sumner daily activity, exam
12	2	Use words in their correct context to enhance meaning.	Good reasoning is the affirmation of praise through wh resembles criticis	In-person lectures participation and discussion	Sumner daily activity, exam
13	2	Identifying the strengths a weaknesses of literary tex	Verbal embellishments include alliteratio rhyme, quotation, and allusion.	In-person lectures participation and discussion	Sumner daily activity, exam
14	2	Correcting incorrect language practices and improving grammatical ar spelling proficiency	Common linguisti errors	In-person lectures participation and discussion	Sumner daily activity, exam
15		End-of-course exam	End-of-course exa	Attend the exam	Attend the exa

11. Course Evaluation

Grade distribution: (25) marks for the midterm exam (5) marks including daily participation, assignments, and attendance (70) marks for the final exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	nothing
Main references (sources)	The Holy Quran, Al-Suyuti's interpretation a explanation of Quranic vocabulary, Ibn Aq commentary on Ibn Malik's Alfiyya, Al-Nahw Wafi, Mustafa Al-Ghalayini's Jami' Al-Durus Arabiyya, spelling and punctuation in Ara writing, Al-Mutanabbi's poetry collection,

	Jawahiri's poetry collection, Adab Al-Katib, Mizan Al-Sarfi, and Jawahir Al-Balaghah
Recommended books and references (scientific journals, reports…)	Books on poetic text analysis
Electronic References, Websites	nothing

1. Course Name:
Pathophysiology
2. Course Code:
315
3. Semester / Year:
The first semester/ Third year
4. Description Preparation Date:
2026\2\14
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
5 hours per week (3 theoretical hours and 2 practical hours) / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Zainab Sattar Ali Email: **zainbsatarali@mu.edu.iq**
8. Course Objectives

Course Objectives	· Describe the basic concepts of pathophysiology at the cellular level related to injury, the self-defense mechanism, mutation, and cellular proliferation. · Outline basic pathological factors that influence the disease process. · Describe the impact and abnormal functions upon the organ (s) associated with the disease process of targeted body systems. · Describe clinical manifestations associated

	with the diseased organ(s).

9. Teaching and Learning Strategies

Strategy	· Cooperative education strategy. · Teaching strategy brainstorming. · Education strategy one minute paper. · Education strategy real time feedback · Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	3	Cell injury and tissue response	Degeneration; Necrosis	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	3	Cell injury and tissue response	Atrophy; Hypertrophy; Metaplasia and Calcification	=	=
3.	3	Inflammation	Inflammation and Repair.	=	=

4.	3	Disorders of electrolytes	water and acid–base balances: Hyper And Hyponatremia; Hyper and Hypokalemia; Syndrome of inappropriate secretion of ADH; Diabetes insipidus; Metabolic acidosis and alkalosis; Respiratory acidosis and alkalosis.	=	=
5.	3	Disorders of cardiovascular system	Hyperemia; Congestion and edema; Thrombosis; embolism and infarction; Shock; Coronary heart disease and MI; Rheumatic heart disease; Heart failure.	=	=
6.	3	Disorders of cardiovascular system	Acute pulmonary edema; Essential hypertension; Secondary hypertension; Malignant hypertension; Hypotension; Aneurysm versus varicose veins.	=	=
7.	3	Disorders of respiratory system	Pneumonias; Tuberculosis; Respiratory distress syndrome; Bronchial asthma	=	=
8.	3	Disorders of respiratory system	Emphysema and bronchiectasis; Cystic fibrosis; Pulmonary embolism; Pulmonary hypertension.	=	=

9.	3	Disorders of the renal system	Nephrotic syndrome; Glomerulonephritis; Diabetic glomerulosclerosis; Hypertensive	=	=
			glomerular disease; Pyelonephritis.		
10.	3	Disorders of the renal system	Drug related nephropathies; Acute renal failure; Chronic renal failure	=	=
11.	3	Disorders of GI and hepatobiliary systems	Peptic ulcer and Zollinger–Ellison syndrome; Irritable bowel syndrome ,Crohn's disease; Diarrhea; Celiac disease; Viral hepatitis; Primary biliary cirrhosis; Liver failure; Cholelithiasis.	=	=
12.	3	Disorders of thyroid function	Hypothyroidism. Hyperthyroidism. Graves's disease. Thyrotoxicosis.	=	=
13.	3	Disorders of adrenal function	Cushing syndrome. Adrenal cortical Insufficiency (primary and secondary). Congenital adrenal hyperplasia. Pheochromocytoma.	=	=
14.	3	metabolic syndrome	Diabetes mellitus	=	=
15.	3	Metabolic &rheumatic disorders of skeletal system	Metabolic &rheumatic disorders of skeletal system	=	=
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 40% striving (20% mid-term exam score, 20% daily preparation, daily and oral exams, and classroom activities) 60% final exam score

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Carol Mattson Porth 2Ed.and pathophysiologly of disease.
Main references (sources)	(Robbins Pathology) Vinay Kumar, Abul K. Abbas, Jon C. Aster - Robbins Basic Pathology-Elsevier (2017)
Recommended books and references (scientific journals, reports...)	Introduction to clinical medicine 7ed.Cary D.Hammer
Electronic References, Websites	https://scholar.google.com/

1. Course Name:
Biochemistry I
2. Course Code:
3. Semester / Year:
The first semester/ fifth year
4. Description Preparation Date:
6/2/2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
5 hours per week (3 theoretical hours and 2 practical hours) / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: Prof.Dr.Habiba Khdair abdalsada Email: Habiba.khdair@mu.edu.iq
8. Course Objectives

Course Objectives	**This course regarded as an introduction to basic biochemistry and will be us for students who want to study Biochemistry.** **The course uses simple protocols and available materials and instrument understand Biochemical substances.** **–Some experiments were put to teach students how to work independentl the any Lab.** **– Modern lab researchers should know the principles of the biochem methods of analysis and to learn the main theoretical statements. For it, med Lab Science students have to get the minimum of manual skills during a resea of biochemistry, eg. measuring out solutions and biological liqui centrifugation, colorimetry of colored solutions, determination of peculiarities of the technique of enzyme investigations etc.**

9. Teaching and Learning Strategies	
Strategy	1.Understand the theory and Knowledge in Biochemistry that is neede for interpretation of test results . 2. Understand basic laboratory quality control concepts and apply principles of safety regulations during testing. 3. Enhance student's creative and innovative thinking skills through "brainstorm" questions. 4. Use a wide range of idea based on their knowledge in this course to suggest research method related to chemistry and apply that on different scientific fields

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	3	The student understands the scop of biochemistry and role in explaining biological processes the molecular level.	Familiarity with what biochemistry studies	Blackboard, video, pictures, diagrams, PDF lecture	Final exam, mid-term exam, daily and oral exams
2.	3	The student explains the structure, classification, properties, and different forms of amino acids and rela them to biological function.	Amino Acids: Structure, classification, properties, and forms of amino acids	=	=
3.	3	The student explains zwitterionic behavio and isoelectric pH of amino acids and discusses the clinica relevance of selected non-proteinogenic amino acids.	Chemical reactions, zwitterion, isoelectric pH, non-proteogenic amino acids, and clinical importance	=	=
4.	3	The student explains peptide bond format and the structure and function of selected biologically importa peptides.	Peptide bond, structure and function of some important peptides in human	=	=
5.	3	The student distinguishes primar secondary, tertiary, a quaternary protein structures and explai the bonds stabilizing each level.	Order of protein structure, bonds in proteins of different order of structure	=	=
6.	3	The student explains general methods for determining amino a sequence and their importance in defini protein function.	Determination of the amino acids sequence in primary order proteins	=	=
7.	3	The student explains the importance and basic approaches for identifying the N- ar C-termini of polypeptide chains.	Determination of the N and C termini	=	=

8.	3	The student explains the chemical nature, classification, and biological roles of carbohydrates.	Chemistry, classification of carbohydrates	=	=
9.	3	The student distinguishes saturated and unsaturated fatty acids and explains their clinical and health relevance.	Clinical importance and classification, saturated and unsaturated fatty acids	=	=
10.	3	The student explains enzyme structure, nomenclature, and major classes, and relates these to catalytic function.	Enzymes structure, nomenclature, and classification	=	=
11.	3	The student explains factors affecting enzyme activity (e.g., temperature, pH, substrate/enzyme concentration).	General principles, factors affecting the rate of enzyme catalyzed reaction	=	=
12.	3	The student distinguishes types of enzyme inhibition and explains their effects on reaction rates.	The competitive and noncompetitive inhibitors, irreversible inhibition	=	=
13.	3	The student explains the concept of rate-limiting steps and their role in metabolic regulation.	The ideal enzyme-catalyzed step for regulation of a metabolic pathway	=	=

14.	3	The student explains mechanisms of endocrine hormone action and receptor-mediated signaling.	The basic principles of endocrine hormone action	=	=
15.	3	The student explains the sequence of events in hormonal signaling from stimulus to cellular response	The roles of stimulus, hormone release, signal generation, and response	=	=

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 40% striving (20% mid-term exam score, 20% daily preparation, weekly and oral exams, and classroom activities) 60% final exam score	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	The unified evaluative curriculum for colleges of pharmacy in Iraq
Main references (sources)	Harper's Illustrated Biochemistry, Latest edition.
Recommended books and references (scientific journals, reports...)	Lippincott's illustrated ;biochemistry
Electronic References, Websites	PubMed ; Khan Academy

1. Course Name:

Biochemistry II

2. Course Code:

3. Semester / Year:

The second semester / third class

4. Description Preparation Date:

6/2/2026

5. Available Attendance Forms:

In presence

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

5 hours per week (3 theoretical hours and 2 practical hours) / 4 units

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

Name: Prof.Dr.Habiba Khdair abdalsada
Email: Habiba.khdair@mu.edu.iq

8. Course Objectives

Course Objectives	To provide a condensed curriculum of strong basic biochemistry and molecular biology. At the end of the semester the students should be able to understand all metabolic processes occurring in the living cell

9. Teaching and Learning Strategies

Strategy	1.Understand the theory and Knowledge in Biochemistry that is needed for interpretation of test results . 2. Understand basic laboratory quality control concepts and apply principles of safety regulations during testing. 3. Enhance student's creative and innovative thinking skills through "brainstorm" questions. 4. Use a wide range of idea based on their knowledge in this course to suggest research method related to chemistry and apply that on different scientific fields

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	1	The student explains the laws of thermodynamics and the concepts of energ entropy, and Gibbs f energy (ΔG.(The student distinguishes betwee exergonic and endergonic reactions and analyzes their spontaneity in biological systems.	The application of the laws of thermo-dynamics in biological systems	Blackboard, video, pictures, diagrams, PDF lecture	Final exam, mid-term exam, daily and oral exams

		The student explains the role of ATP and energy coupling in driving unfavorable reactions inside the cell.			
2.	2	The student explains mechanisms of metabolic pathway regulation and levels enzymatic control. The student differentiates betwee allosteric regulation, regulation by phosphorylation, and hormonal regulation The student explains the importance of metabolic regulation maintaining homeostasis.	Methods of regulating of the flow of metabolites through metabolic pathways	=	=
3.	3	The student explains the steps of glycolys and relates them to energy production. The student distinguishes betwee aerobic and anaerobi fates of pyruvate. The student explains the metabolic role of converting pyruvate acetyl-CoA.	Glycolysis and the oxidation of pyruvate	=	=
4.	3	The student explains the steps of the Kreb cycle and its central role in metabolism. The student links the cycle to the producti of reducing equivale (NADH, $FADH_2$.(The student explains the role of the cycle integrating carbohydrate, lipid, a protein metabolism.	The citric acid cycle	=	=
5.	3	The student explains the components of th electron transport ch and the generation o	The respiratory chain and oxidative phosphorylation	=	=

		the proton motive force. The student explains ATP synthesis according to the chemiosmotic theory The student distinguishes the effects of inhibitors and uncouplers on energy production.			
6.	3	The student explains the pathways of glycogen synthesis a breakdown. The student distinguishes hormo regulation in liver ar muscle. The student explains the role of glycogen maintaining blood glucose levels.	Metabolism of glycogen	=	=
7.	3	The student explains the gluconeogenesis pathway and its mai steps. The student distinguishes gluconeogenesis fro glycolysis in directio and regulation. The student explains the role of hormones regulating blood glucose concentratio	Gluconeogenesis and the control of blood glucose	=	=
8.	3	The student explains the phases of the pathway and its function in producing NADPH and ribose-5-phosphate. The student explains the importance of NADPH in biosynthesis and antioxidant defense.	The Pentose Phosphate Pathway	=	=

		The student links the pathway to other metabolic pathways.			
9.	3	The student explains alternative pathways of glucose, fructose, and galactose metabolism. The student distinguishes the physiological importance of each pathway. The student explains metabolic disorders associated with defects in these pathways.	Other pathways of hexose metabolism	=	=
10.	1	The student explains mechanisms of nonessential amino acid biosynthesis. The student links intermediary metabolism to amino acid formation. The student explains the importance of these pathways in supporting nitrogen balance.	Biosynthesis of the nutritionally nonessential amino acids	=	=
11.	2	The student explains transamination and deamination mechanisms.	Catabolism of proteins and of amino acid nitrogen	=	=

		The student explains the role of the urea cycle in ammonia detoxification. The student links these processes to nitrogen balance in the body.			
12.	1	The student explains the fate of amino acid carbon skeletons. The student distinguishes glucogenic and ketogenic amino acids. The student links amino acid catabolism to central metabolic pathways.	Catabolism of the carbon skeletons of amino acids	=	=
13.	1	The student explains the formation of specialized biomolecules derived from amino acids. The student explains the physiological importance of neurotransmitters and hormones derived from amino acids. The student links these conversions to specialized biological functions.	Conversion of amino acids to specialized products	=	=
14.	1	The student explains heme biosynthesis	Porphyrins and bile pigments	=	=

		and bilirubin metabolism. The student explains the role of heme in oxygen transport and cellular functions. The student links disorders of this pathway to specific diseases.			
15.	3	The student explains the steps of beta-oxidation of fatty acids. The student explains the energy yield from lipid oxidation. The student links fatty acid oxidation to fasting and muscular activity.	Oxidation of fatty acids	=	=
16.	3	The student explains the steps and regulation of fatty acid biosynthesis. The student explains the role of eicosanoids in inflammatory responses and cellular regulation. The student distinguishes sources of lipids and their metabolic functions.	Biosynthesis of fatty acids and eicosanoids	=	=
17.	3	The student explains synthesis and	Metabolism of acylglycerols and sphingolipids	=	=

		degradation pathways of complex lipids. The student explains the role of sphingolipids in cellular membranes. The student links lipid metabolic disorders to metabolic diseases.			
18.	3	The student explains mechanisms of lipid transport via lipoproteins. The student distinguishes types of lipoproteins and their functions. The student explains the role of adipose tissue in energy storage.	Lipid transport and storage	=	=
19.	3	The student explains cholesterol biosynthesis and its regulation. The student explains mechanisms of cholesterol transport and excretion. The student links cholesterol metabolism disorders to cardiovascular diseases.	Cholesterol synthesis, transport, and excretion	=	=

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

40% striving (20% mid-term exam score, 20% daily preparation, weekly and oral exams, and classroom activities) 60% final exam score

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**The unified evaluative curriculum for colleges of pharmacy in Iraq**
Main references (sources)	**Harper's Illustrated Biochemistry, Latest edition**.
Recommended books and references (scientific journals, reports...)	**Lippincott's illustrated ;biochemistry** **Lehninger Principles of Biochemistry, 8th ed**
Electronic References, Websites	**PubMed ; Khan Academy**

Course Description

1. Course Name:
Medical Ethics
2. Course Code:
3211
3. Semester / Year:
The second semester/ Third year
4. Description Preparation Date:
2026\2\27
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
1 hour per week (1 theoretical hour) / 1 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Amer Khazal Jaber Email: amer.khazal@mu.edu.iq
8. Course Objectives

Course Objectives	• Provides an overview of ethical issues facing practicing pharmacists in order to enable the student to understand the basic concepts of ethics. • Studying strategies which formulate the relationship of pharmacist with the patient, colleges, and other health personnel in order to deliver his pharmaceutical services in good way.

9. Teaching and Learning Strategies

Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	1	Introduction to Pharmacy Ethics	Introduction; energy balance, metabolism and nutrition	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams

2.	1	Introduction to Pharmacy Ethics	Theoretical Considerations	=	=
3.	1	Code of Ethics Pharmacists.	(Beneficence, Autonomy, non-maleficience)	=	=
4.	1	Common Ethical Considerations in Pharmaceutical Care Practice	Professional Integrity and Prior Approval	=	=
5.	1	Common Ethical Considerations in Pharmaceutical Care Practice	(Honesty, Informed Consent)	=	=
6.	1	Common Ethical Considerations in Pharmaceutical Care Practice	(Confidentiality, Fidelity, Veracity, Justice, Concordance)	=	=
7.	1	Inter-professional Relations.	Responsibility of pharmacist in building relationship	=	=
8.	1	Inter-professional Relations.	Medication Therapy Management	=	=
9.	1	Making ethical decisions	Identifying issues and resources for the process for decision-making	=	=
10.	1	Ethical issues related to clinical pharmacy research.	Approval of Research proposals and Use of animals in preclinical studies.	=	=
11.	1	Ethical problems in the pharmacist's clinical practice.	Ethics and the Promotion of Prescription Drugs	=	=
12.	1	Preventing misuse of medicines.	missuse and abuse of drugs Acts and Law.	=	=
13.	1	Case studies in pharmacy ethics.	Selected case from Hospital clinics	=	=
14.	1	Case studies in pharmacy ethics.	Selected case from Pharmacies	=	=
15.	1	Case studies in pharmacy ethics.	Selected case from health care institution.	=	=

11. Course Evaluation

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

30% striving (20% mid-term exam score, 10% daily preparation, daily and oral exams, and classroom activities such as seminars and case studies)

70% final exam score

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	The unified evaluative curriculum for colleges of pharmacy in Iraq
Main references (sources)	Ruth Rodgers, (ed); fast track Law and Ethics in Pharmacy Pract Pharmaceutical Press 2010.
Recommended books and references (scientific journals, reports...)	- Joy Wingfield and David Badcott. Pharmacy Ethics and Decision Making. Pharmaceutical Press 2007. Robert m. Veatch and Amy Haddad. Case Studies in Pharm Ethics. 2nd Copyright C 2008 by Oxford University Press, Inc.
Electronic References, Websites	https://scholar.google.com/

1. Course Name:

Public health

2. Course Code:

415

3. Semester / Year:

First semester/ fourth year

4. Description Preparation Date:

2026−2025

5. Available Attendance Forms:

Yes- in class

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

2 hours weekly-30 hours total / 2 units

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

Name: Noor Thamer Alsaadi
Email: noora-thamer@mu.edu.iq

8. Course Objectives

To enable the students to understand the primary principle of public heal the art of preventing the spread of diseases, promoting for hea through organizations.	• ..... • ..... • .....

9. Teaching and Learning Strategies

Strategy	

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	introduction	Health-careinIraq, measuring and evaluati the public health	Boards, powerpoints, figures, pictur	Quizzes, midterm exam, fi exam
2	2	Population screening	Population screening a		

			public health dat prevention of n communicable diseases		
3	2	Infectious diseas	Control of infectic diseases& immunizati plan		
4	2	Communicable diseases	Gastrointestinal diseases, sl infections, respiratory tr infections.		
5	2	Major hea problems	Obesity, physi activity, den health, liv diseases		
6	2	Nutritional disorders	Family health		
7	2	Environmental health	Occupational health		
8	2	Travel health	Pharmacy practic		
9	2	Health care syste	Health promotio		
10	2	Pharmaceutical care planning	Ph. Care strategy		
11	2	Community pharmacy	Community pharmacy management		
12	2	Hospital pharma services	Hospital pharma services		
13	2	Pharmacy practi	Biosafety pharmacy		
14	2	Formulary management	Regulatory affair		
15	2	Drug abuse	Rational drug use		

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 ....
25% mid term, daily exam 5% daily participation, 70% final exam.

12. Learning and Teaching Resources

Public health medicine for tropics 2003	
Lucas AO, Gilles HM	

Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:

Clinical Laboratory Training

2. Course Code:

515

3. Semester / Year:

The first semester / Fifth year

4. Description Preparation Date:

14\2\2026

5. Available Attendance Forms:

In presence

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

4 hours per week / 2 units

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

Name: Dr. Zainab Sattar Ali
Email: zainbsatarali@mu.edu.iq

8. Course Objectives

Course Objectives	●It provides general information about the biochemical basis of disease and about the principles of laboratory diagnosis. ●It supplies specific guidance on the clinical value of chemical investigations, indicating their range of application and limitations as well as relating results of laboratory tests to the process of clinical diagnosis and management as these might applied to individual patients.

9. Teaching and Learning Strategies

Strategy	● Cooperative education strategy. ● Teaching strategy brainstorming. ● Education strategy one minute paper. ● Education strategy real time feedback ● Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	4	Diagnostic test basics.	Collecting &transporting specimens venipuncture, urine specimen, stool specimen.	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	4	General urine examination	urine specimen collection and examination	=	=
3.	4	Biochemical tests	Fasting blood glucose,	=	=

4.	4	Biochemical tests	Post-prandial glucose, Oral glucose tolerance test.	=	=
5.	3	Biochemical tests	Cholesterol, Lipoproteins, triglycerides.	=	=
6.	4	Biochemical tests	Blood urea, Blood creatinine.	=	=
7.	4	Biochemical tests	Creatinine clearance, Uric acid.	=	=
8.	4	Biochemical tests	Blood proteins, Bilirubin.	=	=
9.	4	Biochemical tests	Calcium, Inorganic phosphate; Serum chloride	=	=
10.	4	Biochemical tests	Alkaline phosphatase, Acid phosphatase, Alanine amiotransferase, Aspartate aminotransferase, Lactate dehydrogenase, Creatine phosphokinase.	=	=
11.	4	Serological tests	VDRL, ASO- Titer, Hepatitis tests.	=	=
12.	4	Serological tests	C-reactive protein test, Rheumatic factor test, Rosebengal test.	=	=
13.	4	Serological tests	Typhoid fever test(Widal test), Pregnancy Test.	=	=
14.	4	Hematological tests.	RBC count, Hb, PCV, RBC indices, WBC count, Platelets count. Blood typing, Coombs test, Bleeding time, ESR.	=	=
15.	4	Microbiological tests	culture and sensitivity tests, Staining methods Culture media, Enriched culture media for general use Tests for identification of bacteria, Disk diffusion tests of sensitivity to antibiotics, Choice of drugs for disk test, bacterial disease and their laboratory diagnosis.	=	=

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

40% striving)mid-term exam score, daily preparation, daily and oral exams, and classroom activities)

60% final exam score.

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Clinical Biochemistry An Illustrated Colour Text 5th 2013
Main references (sources)	Henry's Clinical Diagnosis And Management By Laboratory Methods, 23e
Recommended books and references (scientific journals, reports...)	Henry's Clinical Diagnosis And Management By Laboratory Methods, 23e
Electronic References, Websites	https://scholar.google.com/

وصف المقرر

1. Course Name:
Clinical chemistry
2. Course Code:
3. Semester / Year:
The first semester/ fifth class
4. Description Preparation Date:
6/2/2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
5 hours per week (3 theoretical hours and 2 practical hours) / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: Prof.Dr.Habiba Khdair abdalsada Email: Habiba.khdair@mu.edu.iq
8. Course Objectives

Course Objectives	**This course regarded as an introduction to basic biochemistry and will be useful for students who want to study clinical chemistry.** **The course uses simple protocols and available materials and instruments to understand Biochemical substances.** **to exhibit knowledge of human body chemistry levels under healthy and abnormal conditions. At the end of the semester the students should be familiar with the basic and advanced information in clinical laboratory chemistry and how it relates to patient health and care.**

9. Teaching and Learning Strategies

Strategy	**1. Understand the theory and Knowledge in clinical chemistry that is needed for interpretation of test results in case of health and disease.** **2. Discuss the basic disorders of the different organs and define which laboratory tests may be performed to diagnose them.** **3. Understand basic laboratory quality control concepts and apply principles of safety regulations during testing.** **4. Enhance student's creative and innovative thinking skills through "brainstorm" questions.** **5. Use a wide range of idea based on their knowledge in this course to suggest research method related to chemistry and apply that on different scientific fields**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	4	Explain the biochemical pathways of glucose metabolism and their regulation.	Disorders of Carbohydrates	Blackboard, video,	Final exam, mid-

		Interpret laboratory tests used for the diagnosi and monitoring of diabetes mellitus. Differentiate between hyperglycemia and hypoglycemia based on clinical and biochemi findings.	metabolism, Hyperglycemia & Diabetes mellitus, Hypoglycemia	picture s, diagra ms, PDF lecture	term exam, daily and oral exam s
2.	3	Describe lipid metabolism pathways and lipoprotein transport. Interpret lipid profile parameters in cardiovascular risk assessment. Correlate dyslipidemia with metabolic and endocrine disorders.	Disorders of Lipid Metabolism	=	
3.	3	Identify biochemical markers of hepatocellular injury and cholestasis. Interpret liver function tests in different hepatic diseases. Correlate abnormal LFTs with clinical presentations.	Liver Function Tests (LFTs)	=	
4.	3	Explain renal physiology and biochemical indicators of renal function. Interpret serum and urine markers in acute and chronic kidney diseases. Evaluate glomerular filtration rate (GFR) using laboratory parameters.	Kidney Function Tests (KFTs)	=	
5.	3	Describe the clinical significance of diagnostic enzymes in tissue damage. Interpret enzyme activity patterns in myocardial, hepatic, and muscular disorders. Evaluate isoenzymes and biomarkers in differential diagnosis.	**Diagnostic Enzymology**	=	
6.	6	Explain hormonal regulation of the hypothalamic–pituitary–adrenal (HPA) axis. Interpret laboratory tests for pituitary and adrenal hormone disorders. Correlate endocrine dysfunctions with biochemical test results.	Hypothalamus & Pituitary Endocrinology, Adrenal Gland	=	
7.	6	Describe the hormonal control of reproductive function. Interpret laboratory markers of male and female gonadal disorders. Correlate endocrine profiles with infertility and reproductive diseases.	Reproductive System & Disorders of Gonadal Function (Males & Females)	=	
8.	3	Explain thyroid hormone synthesis, transport, and regulation. Interpret thyroid function tests in hypo- and hyperthyroidism. Correlate thyroid disorders with clinical and biochemical findings.	Thyroid Function Tests	=	

9.	3	Identify drugs that interfere with laboratory test results. Explain mechanisms of analytical and biological interferences. Apply this knowledge to avoid misinterpretation of laboratory data.	**Drug Interaction with Laboratory Tests**	=	
10	3	Describe calcium homeostasis and its hormonal regulation. Interpret laboratory tests in hypercalcemia and hypocalcemia. Correlate calcium disorders with bone and endocrine diseases.	Disorders of Calcium Metabolism	=	
11	2	Identify major tumor markers and their clinical applications. Interpret tumor marker levels in cancer diagnosis and follow-up. Evaluate the limitations of tumor markers in screening and prognosis.	Tumor Markers	=	
12	6	Describe the biochemical basis of inherited metabolic disorders. Interpret screening and diagnostic tests for inborn errors of metabolism. Correlate metabolic abnormalities with clinical manifestations in neonates and children.	Inborn Errors of Metabolism	=	

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
40% striving (20% mid-term exam score, 20% daily preparation, weekly and oral exams, and classroom activities) 60% final exam score

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	The unified evaluative curriculum for colleges of pharmacy in Iraq
Main references (sources)	CLINICAL BIOCHEMISTRY AND METABOLIC MEDICINE By Martin A Crook
Recommended books and references (scientific journals, reports...)	1. "Tietz Textbook of Clinical Chemistry and Molecular Diagnostics" by Carl A. Burtis, Edward R. Ashwood, and David E. Bruns. 2. "Principles of Clinical Biochemistry" by Michael L. Bishop and Edward P. Fody.
Electronic References, Websites	PubMed ; Khan Academy ; Clinical Biochemistry: Fundamentals of Biomedical Science. (2017). Authors: Nessar Ahmad. 2th edition, Publisher: Oxford University, UK.

Course Description Form

1. Course Name:
clinical pharmacy I
2. Course Code:
3. Semester /
Year:4th year/first semester
4. Description Preparation Date:
14\2\2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical hours /2 practical hours
7. Course administrator's name (mention all, if more than one name)
Name: zina tahsin ali Email:dr_zta@mu.edu.iq

8. Course Objectives	
Course Objectives	-get knowledge &skills to optimize individual therapy by maximizing drug effectiveness, safety & resolve drug related problems concert with mainer ailment and OTC products .

9. Teaching and Learning Strategies	
Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction to community pharmacy.	Introduction to community pharmacy.	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam mid-term exam, daily and oral exams

2,3	4	**Respiratory problems:** Cough, Common cold, allergic rhinitis, Otitis media, Laryngitis & Pharyngitis	**Respiratory problems:** Cough, Common cold, allergic rhinitis, Otitis media, Laryngitis & Pharyngitis	=	=
4,5	4	**G.I.T problems**: Diarrhea, Constipation, Heart burn and indigestion, and Hemorrhoids	**G.I.T problems**: Diarrhea, Constipation, Heart burn and indigest IBS and Hemorrhoids	=	=
6	2	**Pediatric care practice :** Oral thrush, pinworms and head lice	**Pediatric care practice :** Oral thrush, pinworms and head lice	=	=
7,8	4	**Skin conditions:** Acne, Scabies, Psoriasis, Hair loss, Fungal infection, Eczema and Dermatitis Dandruff, Cold sore, Corns Callus.	**Skin conditions:** Acne, Scabies, Psoriasis , Hair loss, Fungal infection, Eczema and Dermatitis Dandruff, Cold sore, Corns Callus.	=	=
9	2	**Women's health care:** Cystitis and vaginal thrush, primary dysmenorrhea and Premenstrual syndrome	**Women's health care:** Cystitis and vaginal thrush, primary dysmenorrhea and Premenstrual syndrome	=	=
10,11	4	**CNS related problems:** Headache, Insomnia, Motion sickness, Nausea vomiting	**CNS related problems:** Headache, Insomnia, Motion sickness, Nausea vomiting	=	=
12	2	**Eye problems**	**Eye problems**	=	=
13	2	**ENT problems**	**ENT problems**	=	=
14	2	Oral hygiene, mouth ulcer Nicotine replacement therapy (NRT)	Oral hygiene, mouth ulcer Nicotine replacement therapy (NRT)	=	=
15	2	-Pain and musculoskel disorders	Pain and musculoskel disorders	=	=

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 40% striving (20% mid-term exam score, 20% practical, daily preparation, daily and oral exams, and classroom activities) 60% final exam score

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	-ALISON BLENKINSOPP, PAUL PAXTON(eds), Symptoms in the Pharmacy. A Guide to Management of Common Illness, 6th edition. Lor –waterfield, Community Pharmacy Hand Book, 5th edition.

Recommended books and references (scientific journals, reports…)	-Joseph T. DiPiro, Robert L. Pharmacotherapy Pathophysiologic Approach, 12 th Edition. 2023. -GINA guideline. 2023.
Electronic References, Websites	https://scholar.google.com

Course Description Form

1. Course Name:
clinical pharmacy II
2. Course Code:
3. Semester /
Year:4th year/second semester
4. Description Preparation Date:
14\2\2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical hours /2 practical hours
7. Course administrator's name (mention all, if more than one name)
Name: zina tahsin ali Email:dr_zta@mu.edu.iq
8. Course Objectives

Course Objectives	−get knowledge &skills to optimize individual therapy by maximizing drug effectiveness, safety & resolve drug related problems .

9. Teaching and Learning Strategies	
Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2,3	6	**(Cardio vascular disorders):** -Hypertension. -Ischemic heart disease -Heart failure.	**(Cardio vascular disorders):** -Hypertension. -Ischemic heart diseases -Heart failure.	Blackbo d, video picture diagram PowerP nt lectu	Final exam, mid-term exam, daily and oral exams

4,5,6	6	**(infectious diseases):** -UTI infections. -CNS infections. - TB infection.	**(infectious diseases):** -UTI infections. -CNS infections. - TB infection.	=	=
7,8	4	**(Respiratory disorders**) -Asthma -COPD	**(Respiratory disorders)** -Asthma -COPD	=	=
9,10, 11	6	**(Rheumatologic Disorde** -RA -OA -Gout and Hyperuricemia -Osteoporosis	**(Rheumatologic Disorders):** -RA -OA Gout and Hyperuricemia -Osteoporosis	=	=
12	2	**(HematologicDisorders**) -Anemia	**HematologicDisorders**) -Anemia	=	=
13	2	**(Gastrointestinaldisorders)** - Peptic Ulcer Disease	**Gastrointestinaldisorders)** - Peptic Ulcer Disease	=	=
14,15	4	**(Endocrine disorders**): - Diabetes Mellitus	**(Endocrine disorders**): - Diabetes Mellitus	=	=

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 40% striving (20% mid-term exam score, 20% practical, daily preparation, daily and oral exams, and classroom activities) 60% final exam score

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Roger Walker, Clive Edwards (eds), Clinical Pharmacy & Therapeutics
Main references (sources)	-ACCP 2023 3-Global Initiative for Chronic Obstructive Lung Disease. -GLOBAL STRATEGY FOR PREVENTION, DIAGNOSIS AND MANAGEMENT OF COPD: 2023 Report. Global Initiative for Chronic Obstructive Lung Disease - GOLD. 2023.
Recommended books and references (scientific journals, reports…)	-Joseph T. DiPiro, Robert L. Pharmacotherapy Pathophysiologic Approach, 12 th Edition. 2023. -GINA guideline. 2023.
Electronic References, Websites	https://scholar.google.com

Course Description Form

1. Course Name:
Communication skills
2. Course Code:
215
3. Semester / Year:
Second semester – 4th yaer
4. Description Preparation Date:
5-2-2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours weekly (theoretical) – 2 units
7. Course administrator's name (mention all, if more than one name)
Name: Safa Azhar Razzaq Email: Safa_azhar@mu.edu.iq

8. Course Objectives	
Course Objectives	**Communication skill is one of the missions of pharmacy care practice, aims to develop a conventional relationship between pharmacist and patients, in which information is exchanged, hold in confidence and used to optimize patient care through appropriate drug therapy.**

9. Teaching and Learning Strategies	
Strategy	Teaching and learning with modern strategies

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Communication elements	Overview and basic princi of communication skills	Board, pictures, figures , tables	Oral and writt exam

2	2	=	Non-verbal communicatio	=	=
3	2	Barriers	Barriers to communicatio	=	=
4	2	listening	Listening and empathic responding during communication.	=	=
5	2	communication	assertiveness	=	=
6	2	exam	Mid term exam	=	=
7	2	Helping patients	Helping patients to manag therapeutic regimens	=	=
8	2	=	Patient counseling; counseling check list; poin by-point discussion;	=	=
9	2	evaluation	Medication safety and communication skills.	=	=
10	2	=	Strategies to meet specific needs.	=	=
11	2	Conducting analys	Communicating with children and elderly about medications.	=	=
12	2	=	Communication skills and inter-professional collaboration.	=	=
13	2	healthcare	Electronic communication healthcare.	=	=
14	2	ethics	Ethical behavior when communicating with patients.	=	=
15	2	Travel health	Travel health and health insurance	=	=

11. Course Evaluation	
25% mid term exam, 5% quiz and presentations, 70% final exam	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Robert S Beardsley communication skills in pharmacy practice
Recommended books and references (scientific journals, reports…)	-
Electronic References, Websites	https://scholar.google.com

1. Course Name:
Therapeutic drug monitoring
2. Course Code:
529
3. Semester / Year:
The Second / Fifth
4. Description Preparation Date:
2026/3/1
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours per week (2 theoretical hours and 2 practical hours) / 3 units
7. Course administrator's name (mention all, if more than one name)
Name: ：Ali Malik Mahoud

8. Course Objectives

Course Objectives	• Provide students with the principles and skills required to deal with Clinical PK equations and calculations. • To study the principle of Clinical PK in special population and cases • Enables students to distinguish Clinical PK/PD for drugs groups.

9. Teaching and Learning Strategies

Strategy	• Cooperative education strategy. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	2	Review of basic pharmacokinetic (PK) and pharmacodynamic (PD)	General principles	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	2	Clinical PK equations and calculations	Clinical PK equations and calculations	=	=
3.	2	Clinical PK in special population and cases	Clinical PK equations and calculations	=	=
4.	2	Clinical PK/PD for Aminoglycosides	Aminoglycosides	=	=
5.	2	Clinical PK/PD for Vancomycin	Vancomycin	=	=

6.	2	Clinical PK/PD for Digoxin	Digoxin	=	=
7.	2	Mid exam	----------	=	=
8.	2	Clinical PK/PD for Primidone, Ethosuxsimide	Anticonvulsants	=	=
9.	2	Clinical PK/PD for Phenytoin	Phenytoin	=	=
10.	2	Clinical PK/PD for other Anticonvulsants (e.g., Carbamazepine, Valproic Acid, Phenobarbitone	Anticonvulsants	=	=
11.	2	Clinical PK/PD for Theophylline	Theophylline	=	=
12.	2	Clinical PK/PD for Immunossprasants ,(e.g., Cyclosporine Tacrolimus	Immunossprasants	=	=
13.	2	Clinical PK/PD for other Cardiovascular agents (e.g., ,Lidocaine Procainamide/N-Acetyl Procainamide	Cardiovascular agents	=	=
14.	2	Clinical PK/PD of other drugs (e.g., Lithium), Anticancer agents.	Anticancer agents.	=	=
15.	2	Clinical PK/PD of Anticoagulants	Anticoagulants	=	=

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 40% striving (20% mid-term exam score, 20% daily preparation, daily and oral exams, and classroom activities) 60% final exam score

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Applied Clinical Pharmacokinetics, Second . .Edition, 2008 byLarry A. Bauer
Main references (sources)	Clinical Pharmacokinetics Concepts and Applications, Third Edition,
Recommended books and references (scientific journals, reports...)	Clinical Pharmacokinetics Concepts and Applications, Third Edition, 1995 by Malcolm

	Rowland and Thomas Tozer
Electronic References, Websites	https://scholar.google.com

1. Course Name:

Applied Therapeutics I

2. Course Code:

3. Semester / Year:

The first / Fifth

4. Description Preparation Date:

5\2\2026

5. Available Attendance Forms:

In presence

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

3theoretical hours / 3 units

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

Name: Assist. Prof. Safa Azhar Razzaq
Email: Safa_azhar@mu.edu.iq

8. Course Objectives

Course Objectives	The course aims to provide students with the principles and skills required to deal with different diseases and their management in clinical settings; it enables students to correlate signs and symptoms of disease with the analytical data, and to know how to establish preventive and therapeutic measures for different cases.

9. Teaching and Learning Strategies

Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	3	Acute coronary syndrome.	Acute coronary syndrome.	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	3	Arrhythmias	Arrhythmias	=	=
3.	3	Thrombosis	Thrombosis	=	=
4.	3	Dyslipidemia	Dyslipidemia	=	=
5.	3	Stroke	Stroke	=	=
6.	3	Shock	Shock	=	=

7.	3	Liver cirrhosis and Viral hepatitis	Liver cirrhosis and Viral hepatitis	=	=
8.	3	Inflammatory bowel diseases	Inflammatory bowel diseases	=	=
9.	3	Acute renal failure (ARF) and Chronic renal failure (CRF)	Acute renal failure (ARF) and Chronic renal failure (CRF)	=	=
10.	3	Hemodialysis and peritoneal dialysis and Systemic lupus erythematosis (SLE)	Hemodialysis and peritoneal dialysis and Systemic lupus erythematosis (SLE)	=	=
11.	3	Benign prostatic hyperplasia (BPH) Urinary incontinence and pediatric enuresis	Benign prostatic hyperplasia (BPH) Urinary incontinence and pediatric enuresis	=	=
12.	3	Epilepsy and status epilepticus	Epilepsy and status epilepticus	=	=
13.	3	multiple sclerosis and Parkinson's disease	multiple sclerosis and Parkinson's disease	=	=
14.	3	Pain management and Headache disorders	Pain management and Headache disorders	=	=
15.	3	glaucoma	glaucoma	=	=

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
40% striving (35% mid-term exam score, 5% daily preparation, daily and oral exams, and classroom activities)
60% final exam score

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. Joseph T. DiPiro, Robert L. Pharmacotherapy Handbook. 12th Edition. 2023.
Main references (sources)	2. Chisholm-Burns MA, Schwinghammer TL, Malone PM, et al.
Recommended books and references (scientific journals, reports...)	Pharmacotherapy principle and practice. 6th edition. 2022
Electronic References, Websites	https://scholar.google.com/

1. Course Name:
Therapeutics II
2. Course Code:
3. Semester / Year:
The second / Fifth
4. Description Preparation Date:
5\2\2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical hours / 2 units
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Prof. Safa Azhar Razzaq Email: **Safa_azhar@mu.edu.iq**
8. Course Objectives

Course Objectives	The course aims to provide students with the principles and skills required to deal with different diseases and their management in clinical settings; it enables students to correlate signs and symptoms of disease with the analytical data, and to know how to establish preventive and therapeutic measures for different cases.

9. Teaching and Learning Strategies	
Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	2	Adrenal gland disorders	general consideration; host factor,	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	2	Thyroid gland disorders	Thyroid gland disorders	=	=
3.	2	Alzheimer disease	Alzheimer disease	=	=

4.	2	Generalized anxiety disorders	Generalized anxiety disorders	=	=
5.	2	Depressive disorders	Depressive disorders	=	=
6.	2	Schizophrenia	Schizophrenia	=	=
7.	2	Insomnia	Insomnia	=	=
8.	2	Contraception	Contraception	=	=
9.	2	Hormonal replacement therapy	Hormonal replacement therapy	=	=
10.	2	Menstruation related disorders	Menstruation related disorders	=	=
11.	2	Cancer chemotherapy & treatment	Cancer chemotherapy & treatment	=	=
12.	2	Leukemias	Leukemias	=	=
13.	2	Breast cancer	Breast cancer	=	=
14.	2	Prostate cancer	Prostate cancer	=	=
15.	2	Adverse effects of chemotherapy	Adverse effects of chemotherapy	=	=

11. Course Evaluation
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc 30% striving (25% mid-term exam score, 5% daily preparation, daily and oral exams, and classroom activities) 70% final exam score

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1. Joseph T. DiPiro, Robert L. Pharmacotherapy Handbook. 12th Edition. 2023.
Main references (sources)	2. Chisholm-Burns MA, Schwinghammer TL, Malone PM, et al.
Recommended books and references (scientific journals, reports...)	Pharmacotherapy principle and practice. 6th edition. 2022
Electronic References, Websites	https://scholar.google.com/

Course Description Form

1. Course Name:

pharmacoeconomy

2. Course Code:

527

3. Semester / Year:

5th class , 2nd semester

4. Description Preparation Date:

2026 /2/14

5. Available Attendance Forms:

In presence

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

2 hours theoretical / 2 units

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

Name: Noor Thamer Alsaadi
Email: noora-thamer@mu.edu.iq

8. Course Objectives

Course Objectives	**Give the student the basic understand the tool need to asses the cost an outcomes of medications and pharmace cares…..** **Make the students able to evaluate pharmacoeconomics and quality of life.** **Make the students focus on pharmacon researches**

9. Teaching and Learning Strategies

Strategy	Teaching and learning with modern strategies

10. Course Structure

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

1	2	pharmacoeconomics	Overview and ba principle oharmacoeconomics	Board, pictures, figures tables	Or l wr tten ex ms
2	2	=	Cost analysis		
3	2	=	Cost analysis		
4	2	=	Cost analysis		
5	2	CEA	Cost effectiven analysis		
6	2	exam	Mid term exam		
7	2	CUA	Cost util analysis		
8	2	CBA	Cost bene analysis		
9	2	Economic evaluation	The assessment economic evaluation		
10	2	=	Application a cases economic evaluation		
11	2	Conducting analysis	Drug focus analysis		
12	2	=	Disease focus aanalysis		
13	2	introduction	epidemiology		
14	2	CMA	Cost minimizati analysis		
15	2	discounting	The discounti calculation		

11. Course Evaluation

25% mid term exam, 5% quiz and presentations, 70% final exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Bootman JL
Main references (sources)	Townsend RJ, prin iple pharmacoeconomics

Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	https://scholar.google.com/

Course Description Form

Course Name:
Principles of pharmacy
2. Course Code:
3. Semester / Year:
First year/ 1 st semester
4. Description Preparation Date:
2025−2026
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical hours
7. Course administrator's name (mention all, if more than one name)
Name: marwa thamer alsaadi Email: marwa_thamer@mu.edu.iq
8. Course Objectives

Course Objectives	• **Drugs dosage form preparation** • **Drugs dosage form classification and evaluation** • **Stability and solubility affecting factors**
9. Teaching and Learning Strategies	
Strategy	Cooperative education strategy. Teaching strategy brainstorming. Education strategy one minute paper. Education strategy real time feedback Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2	4	Some fundamentals of measurements a calculations. 4	Some fundamentals of measurements a calculations	Blackboard, video, pictures, diagrams,	Final exam, mid-ter

				PowerPoint lecture	exam, daily and ora exams
3	2	Interpretation o prescription or medication orde	Interpretation o prescription or medication orde	=	=
4,5	4	Themetric syste	Themetric syste	=	=
7,6	4	Calculation of doses	Calculation of doses	=	=
9,8	4	Reducing and enlarging formulas.	Reducing and enlarging formulas.	=	=
10,11	4	Density, specific gravity and spec volume	Density, specific gravity and spec volume	=	=
12,13,14		Percentage and ratio strength calculation.	Percentage and ratio strength calculation.	=	=

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
40% striving (40% mid-term exam score, daily preparation, daily and oral exams, and classroom activities)
60% final exam score

12. Learning and Teaching Resources

Required textbo (curricular books any)	Pharmaceutical calculation by ansal haward
Main referen (sources)	Pharmaceutical Calculation by Stoklosa
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Pharmaceutical calculation
2. Course Code:
128
3. Semester / Year:
1st year/ 2nd semester
4. Description Preparation Date:
14\2\2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
3 theoretical hours /2 practical hours / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: marwa thamer alsaadi Email: marwa_thamer@mu.edu.iq
8. Course Objectives

Course Objectives	• **It involves computation of pharmaceutical ingredients, dosage forms,** • **pharmaceutical formulations of extemporaneous compounding, and biological parameters of** • **drug substances. The course teaches calculations for dilution and concentration of different** • **types of liquids and those involved in preparing isotonic solutions, electrolyte solutions and** • **intravenous admixtures.**
9. Teaching and Learning Strategies	
Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback Education strategy notes series.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
5 weeks	10	Dilution and concentration of pharmaceutical preparations.	Dilution and concentration of pharmaceutical preparations. 1	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
6,7,8	6	Isotonic solutions.	Isotonic solutions. 6	=	=
9,10,11	6	Electrolyte solutions (milliequivalents, millimoles and milliosmoles)	Electrolyte solutions (milliequivalents, millimoles and milliosmoles)	=	=
12,13, 14,15	8	Constituted solutions, I.V admixtures and flow rate calculations.	Constituted solutions, I.V admixtures and flow rate calculations.	=	=

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 40% striving (20% mid-term exam score, 20% practical, daily preparation, daily and oral exams, and classroom activities) 60% final exam score

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	Pharmaceutical Calculations by Stoklosa
Main references (sources)	Pharmaceutical calculation by ansual haward
Recommended books and references (scientific journals, reports…)	Pharmaceutical Calculations by Stoklosa
Electronic References, Websites	https://scholar.google.com

Course Description Form

1. Course Name:
Physical pharmacy I
2. Course Code:
213
3. Semester / Year:
First semester/ second year
4. Description Preparation Date:
16\2\2026
5. Available Attendance Forms:
Presence
6. Number of Credit Hours (Total) / Number of Units (Total)
3hours weekly- 45 hours in total / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: NOOR THAMER ALSAADI Email: noora-thamer@mu.edu.iq
8. Course Objectives

Course Objectives: To understand the application of quantitative and theoretical principles of the physical characters of matter in the practice of pharmacy. It aid the pharmacists in their attempt to predict the solubili compatibility and biological activity of drug products. As a result of this knowledge will help in the development of new drugs and dosage forms as well as in improvement of various modes of administration	• ….. • ….. • …..

9. Teaching and Learning Strategies	
Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	State of matter and bonds between molecules	State of matter	Board, pow point, pictures,	Mid-final exam Oral exam

				diagrams, graphs	
2	3	Gases, liquids, solids and crystalline properties	Gases,liquids, solidsand crystalli properties		
3	3	Phase equilibria, phase rule and thermal analysis	Phase equilibria, phase ru thermal analysis		
4	3	solubility	Solvent-solute interaction. Solubility of liquids liquids		
5	3	solubility	Solubility of solids liquids		
6	3	solubility	Poor aquec solubility distribution betwe immiscible solvents		
7	3	Solution of non electrolytes	Solution of non electrolytes		
8	3	Ideal and real solutions	Ideal and real solutions		
9	3	Colligative properties	Colligative properties		
10	3	Solutions of electrolytes	Solutions electrolytes		
11	3	Strong electrolytes Ionic stregnth	Strong electrolytes Ionic stregnth		
12	3	Ionic equilibra	Ionic equilibra		
13	3	pH calculation	pH calculation		
14	3	Buffer solution	Buffer solution		
15	3	Isotonic solutions	Isotonic solutions		

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 ....
35% mid term, daily exam 5% daily participation, 60% final exam.

12. Learning and Teaching Resources

Physical pharmacy	
Physical pharmacy by Alfred martin	
Recommended books and references (scientific journals, reports…)	

Electronic References, Websites	

Course Description Form

1. Course Name:
Pharmaceutical technology I
2. Course Code:
313
3. Semester / Year:
3nd year/ 1st semester
4. Description Preparation Date:
14\2\2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
3 theoretical hours /2 practical hours /4 units
7. Course administrator's name (mention all, if more than one name)
Name: marwa thamer alsaadi Email: marwa_thamer@mu.edu.iq
8. Course Objectives

Course Objective	**To teach theoretical bases for the technology of preparing different dosage forms with respect to their raw materials, compositions, methods of preparation, stability, storage and uses.**
9. Teaching and Learning Strategies	
Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback Education strategy notes series.

10. Course Structure

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

1	3	The concept of preformulation • Solubility • Molecular dissociation	The concept of preformulation • Solubility • Molecular dissociation	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2	3	Dissolution rate Ho • Hygroscopicity	Dissolution rate Ho • Hygroscopicity	=	=
3	3	Physical form • Powder properties • Compaction properties	Physical form • Powder properties • Compaction properties	=	=
4	1	Solution and types of solution	Solution and types of solution	=	=
4	2	Solubility: Factors affecting solubility; expression of dissolution; dissolution rate versus solubility; preparation of solutions containing non-volatile materials.	Solubility: Factors affecting solubility; expression of dissolution; dissolution rate versus solubility; preparation of solutions containing non-volatile materials.	=	=
5	1	Official solutions; classification of official solutions; preparation and uses.	Official solutions; classification of official solutions; preparation and uses.	=	=
5	2	Aqueous solutions contain aromatic principles; aromatic waters;	Aqueous sol. contains aromatic principles; aromatic waters; methods of preparations; stability.	=	=

		methods of preparations; stability.			
6	1	Syrups: sugar based syrups; artificial and sorbitol based syrups; stability of syrups.	Syrups: sugar based syrups; artificial and sorbitol based syrups; stability of syrups.	=	=
6	1	Preparation of solutions using mixed solvent systems; spirits, and elixirs.	Preparation of solutions using mixed solvent systems; spirits, and elixirs.	=	=
7	1	Tinctures; fluid extracts; extracts of resins and oleoresins	Tinctures; fluid extracts; extracts of resins and oleoresins	=	=
8	3	Colloidal dispersions; lyophilic; lyophobic	Colloidal dispersions; lyophilic; lyophobic	=	=
9	3	Coarse dispersion; suspensions	Coarse dispersion; suspensions	=	=
10	3	Types of aerosols • Advantages of the aerosol dosage form • The aerosol principle • Aerosol systems • Aerosol container and valve assembly • Metered-dose inhalers • Filling operations • Packaging,	Types of aerosols • Advantages of the aerosol dosage form • The aerosol principle • Aerosol systems • Aerosol container and valve assembly • Metered-dose inhalers • Filling operations • Packaging, labeling, and storage	=	=

		labeling, and storage			
11	3	Proper Administration and Use of • Proper administration and use of pharmaceutical aerosols • Examples of aerosols • Topical aerosols • Vaginal and rectal aerosols • Foams: Their types and preparation	Proper Administration and Use of • Proper administration and use of pharmaceutical aerosols • Examples of aerosols • Topical aerosols • Vaginal and rectal aerosols • Foams: Their types and preparation	=	=
12	3	Injections • Parenteral routes of administration • Official types of injections	Injections • Parenteral routes of administration • Official types of injections	=	=
13	3	Solvents and vehicles for injections • Colligative properties for injections • Methods of sterilization • Validation/verification of sterility	Solvents and vehicles for injections • Colligative properties for injections • Methods of sterilization • Validation/verification of sterility	=	=
14	3	Packaging, labeling, and storage of injections • Available injections (examples) • Small volume parenterals	Packaging, labeling, and storage of injections • Available injections (examples) • Small volume parenterals	=	=
15	3	Large volume parenterals • Special considerations associated	Large volume parenterals • Special considerations associated with parenteral therapy • Irrigation and dialysis solutions	=	=

		with parenteral therapy • Irrigation and dialysis solutions			

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
40% striving (20% mid-term exam score, 20% practical, daily preparation, daily and oral exams, and classroom activities)
60% final exam score

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition. and Sprowel's American Pharmacy.
Main references (sources)	Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition Sprowel's American Pharmacy.
Recommended books and references (scientific journals, reports…)	Pharmaceutical Dosage Forms - Tablets: Unit Operations and Mechanical Properties
Electronic References, Websites	https://scholar.google.com

Course Description Form

1. Course Name:
Pharmaceutical and cosmetics preparation
2. Course Code:
328
3. Semester / Year:
3rd year/ 2nd semester
4. Description Preparation Date:
12\2\2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
3 theoretical hours /2 practical hours /4 units
7. Course administrator's name
Name: marwa thamer alsaadi Email: marwa_thamer@mu.edu.iq
8. Course Objectives

Course Objective	**To teach theoretical bases for the technology of preparing different dosage forms with respect to their raw materials, compositions, methods of preparation, stability, storage and uses.**
9. Teaching and Learning Strategies	
Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback Education strategy notes series.

10. Course Structure

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

1,2,3	8	Emulsions; purpose of emulsification; methods of emulsification; emulsifying agents; HLB system; stability of emulsions.	Emulsions; purpose of emulsification; methods of emulsification; emulsifying agents; HLB system; stability of emulsions.	Blackboar, video, pictures, diagrams, PowerPoin t lecture	Final exam, mid-term exam, daily and oral exams
3	1	Lotions; liniments and collodions.	Lotions; liniments and collodions.	=	=
4,5,6	9	Suppositories. Suppositories • Uses and applications • Some factors of drug absorption from rectal suppositories • Suppository bases • Formulation variables • Preparation of suppositories (dose replacement calculations) • Manufacturing suppositories • Quality control • Packaging and storage	Suppositories. Suppositories • Uses and applications • Some factors of drug absorption from rectal suppositories • Suppository bases • Formulation variables • Preparation of suppositories (dose replacement calculations) • Manufacturing suppositories • Quality control • Packaging and storage	=	=
7,8,9	9	Semisolid dosage forms. Ointments • Ointment bases • Selection of the	Semisolid dosage forms.	=	=

		appropriate base • Compendial requirements for ointments • Preparation of ointments • Creams • Preparation of creams • Gels: preparation, packaging and storage • Miscellaneous semisolid preparations: pastes, plasters, and glycerogelatins • Packaging semisolid preparations • Examples of ointments, creams and gels • Features and uses of dermatologic preparations • Features and uses of ophthalmic ointments and gels • Features and uses of nasal ointments and gels • Features and uses of rectal preparations • Features and uses of vaginal preparations • Drug release from semisolid dosage forms	Ointments • Ointment bases • Selection of the appropriate base • Compendial requirements for ointments • Preparation of ointments • Creams • Preparation of creams • Gels: preparation, packaging and storage • Miscellaneous semisolid preparations: pastes, plasters, and glycerogelatins • Packaging semisolid preparations • Examples of ointments, creams and gels • Features and uses of dermatologic preparations • Features and uses of ophthalmic ointments and gels • Features and uses of		

			nasal ointments and gels • Features and uses of rectal preparations • Features and uses of vaginal preparations • Drug release from semisolid dosage forms		
10,11,12,13,15	18	Cosmetic Formulations (Cosmetic Formulation of Skin Care Products; by Zoe Diana Draelos and Lauren A. Thaman; Taylor and Francis Group; 2006) • Introduction • Cosmetic formulation of skin care products (Chapter 1) • Toners and astringents (Chapter 5) • Antiperspirants (Chapter 8) • Sunscreens (Chapter 9) • Anti-aging skin care formulations (Chapter 11) • Topical exfoliation—clinical effects and formulating considerations (Chapter 15) • Herbs in cosmeceuticals (Chapter 19)	Cosmetic Formulations (Cosmetic Formulation of Skin Care Products; by Zoe Diana Draelos and Lauren A. Thaman; Taylor and Francis Group; 2006) • Introduction • Cosmetic formulation of skin care products (Chapter 1) • Toners and astringents (Chapter 5) • Antiperspirants (Chapter 8) • Sunscreens (Chapter 9) • Anti-aging skin care	=	=

			formulations (Chapter 11) • Topical exfoliation—clinical effects and formulating considerations (Chapter 15) • Herbs in cosmeceuticals (Chapter 19)		

11. Course Evaluation

Divided 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
40% striving (20% mid-term exam score, 20% practical, daily preparation, daily and oral exams, and classroom activities)
60% final exam score

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition. and Sprowel's American Pharmacy.
Main references (sources)	Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition Sprowel's American Pharmacy.
Recommended books and references (scientific journals, reports…)	pharmaceutical Dosage Forms and Drug Delivery.
Electronic References, Websites	https://scholar.google.com

1. Course Name:

Applied Biopharmaceutics

2. Course Code: 414

3. Semester / Year:

The first / Fourth

4. Description Preparation Date:

5/2/2026

5. Available Attendance Forms:

In presence

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

4 hours per week (2 theoretical hours and 2 practical hours) / 3 units

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

Name: Assist. Prof. Safa Azhar Razzaq
Email: Safa_azhar@mu.edu.iq

8. Course Objectives

Course Objectives	The coarse deals with the physical and chemical properties of drug substance, dosage form and the biological effectiveness of the drug or drug product upon administration, including drug availability in the human or animal body from a given dosage form. The pharmacokinetic part of the coarse deals with the time-coarse of the drug in the biological system, and quantification of drug concentration pattern in normal subjects and in certain disease states.

9. Teaching and Learning Strategies

Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	3	Introduction to biopharmaceutics.	Introduction to biopharmaceutics.	Blackboard, video, pictures, diagrams,	Final exam, mid-term exam, daily

				PowerPoint lecture	and oral exams
2.	3	Biopharmaceutic aspects of products; drug absorption	Biopharmaceutic aspects of products; drug absorption	=	=
3.	3	Biopharmaceutic aspects of products mechanisms of absorption; physicochemical factors; dissolution rate;	Biopharmaceutic aspects of products mechanisms of absorption; physicochemical factors; dissolution rate;	=	=
4.	3	Biopharmaceutic aspects of products; effects of excipients; type of dosage forms.	Biopharmaceutic aspects of products; effects of excipients; type of dosage forms.	=	=
5.	3	One compartment open model.	One compartment open model.	=	=
6.	3	Multicompartment models.	Multicompartment models.	=	=
7.	3	Pharmacokinetics of drug absorption.	Pharmacokinetics of drug absorption.	=	=
8.	3	Bioavailability and bioequivalence.	Bioavailability and bioequivalence.	=	=
9.	3	Clearance of drugs from the biological systems.	Clearance of drugs from the biological systems.	=	=
10.	3	Hepatic elimination of drugs.	Hepatic elimination of drugs.	=	=
11.	3	Protein binding of drugs.	Protein binding of drugs.	=	=
12.	3	Intravenous infusion	Intravenous infusion	=	=
13.	3	Multiple dosage regimens.	Multiple dosage regimens.	=	=
14.	3	Non-linear pharmacokinetics.	Non-linear pharmacokinetics.	=	=
15.	3	Dosage adjustment in renal diseases.	Dosage adjustment in renal diseases.	=	=
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					

40% striving (20% mid-term exam score, 20% practical, daily preparation, daily and oral exams, and classroom activities) 60% final exam score	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Shargel L, Yu AB, (Eds.), Applied Biopharmaceutics and Pharmacokinetics.
Main references (sources)	Shargel L, Yu AB, (Eds.), Applied Biopharmaceutics and Pharmacokinetics.
Recommended books and references (scientific journals, reports...)	Shargel L, Yu AB, (Eds.), Applied Biopharmaceutics and Pharmacokinetics.
Electronic References, Websites	https://scholar.google.com/

1. Course Name:
Industrial pharmacy I
2. Course Code:
3. Semester / Year:
The second / Fourth
4. Description Preparation Date:
16\2\2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
5 hours per week (3 theoretical hours and 2 practical hours) / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: Assistant Leturer layla Hammody Hashim Email layla.alobaid@mu.edu.iq

8. Course Objectives

Course Objectives	• **To teach the pharmacy student the steps of preformulation** • **To integrate knowledge of pharmaceutical technology**

9. Teaching and Learning Strategies

Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	3	mixing	Fluid mixing	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	3	mixing	Mechanism of mixing	=	=
3.	3	mixing	Mixer selection	=	=
4.	3	milling	Size measurment	=	=
5.	3	milling	Type of mill	=	=
6.	3	drying	purpose	=	=

7.	3	drying	Drying of solid	=	=
8.	3	Clarification and filtration	theory	=	=
9.	3	Clarification and filtration	Filter media	=	=
10.	3	Sterilization	validation	=	=
11.	3	sterilization	Method of sterilization	=	=
12.	3	pharmaceutical Dosage form	preformulation	=	=
13.	3	pharmaceutical Dosage form	Sterile product	=	=
14.	3	pharmaceutical Dosage form	Stability	=	=
15.	3	pharmaceutical Dosage form	Quality control	=	=

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
40% striving (20% mid-term exam score, 20% daily preparation, daily and oral exams, and classroom activities)
60% final exam score

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	The unified evaluative curriculum for colleges of pharmacy in Iraq
Main references (sources)	The theory and practice of industrial pharmacy by l lachman et al.
Recommended books and references (scientific journals, reports...)	The theory and practice of industrial pharmacy by l lachman et al.
Electronic References, Websites	https://scholar.google.com/

1. Course Name:
Industrial pharmacy II
2. Course Code:
3. Semester / Year:
The First\ Fifth
4. Description Preparation Date:
16\2\2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
5 hours per week (3 theoretical hours and 2 practical hours) / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: Assistant Leturer layla Hammody Hashim Email layla.alobaid@mu.edu.iq

8. Course Objectives

Course Objectives	• **The coarse enable technique setup for coordination of formulation** • **Learn the principles needed to learn mass production** • **Include different dosage form(capsule, tablet.….)**

9. Teaching and Learning Strategies

Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	3	Dosage form	Advantage and disadvantage	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	3	Dosage form	Powder and granule	=	=
3.	3	Dosage form	Powder and granule	=	=
4.	3	capsule	property	=	=
5.	3	capsule	manufacturing	=	=
6.	3	capsule	Soft and hard	=	=

7.	3	tab	Core and coating material	=	=
8.	3	Tab	Theory and concept	=	=
9.	3	tab	Quality control	=	=
10.	3	tab	manufacturing	=	=
11.	3	Tab coating	Type of coating	=	=
12.	3	coating	Manufacturing	=	=
13.	3	Sustained release	Method of preparing	=	=
14.	3	stability	Storage condition	=	=
15.	3	Stability test	Type of stability	=	=

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
40% striving (20% mid-term exam score, 20% daily preparation, daily and oral exams, and classroom activities)
60% final exam score

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	The unified evaluative curriculum for colleges of pharmacy in Iraq
Main references (sources)	The theory and practice of industrial pharmacy by l lachman et al.
Recommended books and references (scientific journals, reports...)	The theory and practice of industrial pharmacy by l lachman et al.
Electronic References, Websites	https://scholar.google.com/

1. Course Name:
drug delivery system design
2. Course Code:
5212
3. Semester / Year:
5th class, 2nd semester
4. Description Preparation Date:
2026-2-14
5. Available Attendance Forms:
Attendance in class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (٢ theoretical hours) / 2 units
7. Course administrator's name (mention all, if more than one name)
Name: : zainab abdlkadhim Email: zainab.abdlkadhim@mu.edu.iq
8. Course Objectives

Course Objectives	• This course enables students to understand the principles and factors that influence design dosage forms • and the applications of these principles in the practice of pharmaceutical industry.

9. Teaching and Learning Strategies	
Strategy	• Cooperative education strategy. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	2	Steps for New drug development and approval process	New drug development and approval process	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	2	FDA definition and consideration in new drug development and approval process	New drug development and approval process	=	=
3.	2	Pre-formulation studies\ dissolution rate ,physical form Partition coefficient	Pre-formulation studies	=	=

4.		Common terms	Current Good Manufacturing Practice	=	=
5.	2	Definition of GMP, principle of GMP	Current Good Manufacturing Practice	=	=
6.	2	The principles of the pharmaceutical and formulation consideration	pharmaceutical and formulation consideration	=	=
7.	2	Mid exam	----------	=	=
8.	2	Pharmaceutical nanotechnology and nanomedicine	Pharmaceutical nanotechnology	=	=
9.	2	Liposomes, bilayer vesicles and lipid nanoparticles	Pharmaceutical nanotechnology	=	=
10.	2	Nasal drug delivery	Nasal drug delivery	=	=
11.	2	CNS delivery	Nasal drug delivery	=	=
12.	2	Ocular drug delivery	Ocular drug delivery	=	=
13.	2	Ocular drug pharmacokinetic	Ocular drug delivery	=	=
14.	2	Problem in traditional Ocular drug	Ocular drug delivery	=	=
15.	2	Transdermal and transdermal delivery systems	transdermal delivery systems	=	=

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc
30% striving (20% mid-term exam score, 10% daily preparation, daily and oral exams, and classroom activities)
7 transdermal delivery systems 0% final exam score

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Pharmaceutical Dosage. orms and Drug Delivery Systems by Haward A Ansel
Main references (sources)	Pharmaceutical Dosage Forms - Tablets: Unit Operations and Mechanical Properties
Recommended books and references (scientific journals, reports...)	pharmaceutical Dosage Forms and Drug Delivery.
Electronic References, Websites	https://scholar.google.com

1. Course Name:

pharmaceutical biotechnology

2. Course Code:

Course number 5213

3. Semester / Year:

The second / Fifyh

4. Description Preparation Date:

16\2\2026

5. Available Attendance Forms:

In presence

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

1 hours per week/ 1 units

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

Name: Dr. Jihan alqadoori
Email: Jihan.alqadoori@mu.edu.iq

8. Course Objectives

Course Objectives	Study the Formulation of biotechnology product (biopharmaceutical consideration)

9. Teaching and Learning Strategies

Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	1	Biotechnology	Introduction of biotechnology	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	1	Enzyme biotechnology	Study of Enzyme biotechnology	=	=
3.	1	Application of Enzyme biotechnology	Study of Application of Enzyme biotechnology	=	=
4.	1	Biosensors	Study of Biosensors	=	=

5.	1	Protein engineering	Studying the Protein engineering	=	=
6.	1	Genetic engineering	Study of the Genetic engineering	=	=
7.	1	Recombinant DNA technology	Study of the Recombinant DNA technology	=	=
8.	1	Recombinant DNA technology (Gene cloning)	Study of the Gene cloning	=	=
9.	1	Vectors for cloning	Study of Vectors for cloning	=	=
10.	1	Techniques used in Recombinant DNA technology	Study of Techniques used in Recombinant DNA technology	=	=
11.	1	Gel electrophoresis	Study of Gel electrophoresis	=	=
12.	1	PCR (Polymerase Chain reaction)	Study of Polymerase Chain reaction	=	=
13.	1	Application of Recombinant DNA technology in medicine	Study of Application of Recombinant DNA technology in medicine	=	=
14.	1	Application of Recombinant DNA technology interferon	Study of Application of Recombinant DNA technology interferon	=	=
15.	1	Application of Recombinant DNA technology in insulin	Study of the Application of Recombinant DNA technology in insulin	=	=

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
40% striving (20% mid-term exam score, 20% daily preparation, daily and oral exams, and classroom activities)
60% final exam score

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	The unified evaluative curriculum for colleges of pharmacy in Iraq
Main references (sources)	**pharmaceutical biotechnology by Thakur**
Recommended books and references (scientific journals, reports...)	**pharmaceutical biotechnology by Thakur**
Electronic References, Websites	https://scholar.google.com/

Course Description Form

1. Course Name:
Pharmacognosy I
2. Course Code:
2210
3. Semester / Year:
Level: 2nd Class, 2nd Semester
4. Description Preparation Date:
28/2/2026
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
Theory =3 Laboratory =1
7. Course administrator's name (mention all, if more than one name)
Name: Dr.Haider Mahmod Jasim Email: haider.jasim@mu.edu.iq
8. Course Objectives

Course Objecti	1. To enhance the student's knowledge of certain pharmaceutical terminology and extraction techniques. 2. To understand how to classify medicinal plants, their pharmacological relationships, and the benefits and indications for using each type of plant.
9. Teaching and Learning Strategies	
Strategy	**A. Cognitive Objectives** A1. To become familiar with some terminology related to drugs and medicinal plants. A2. To become familiar with the pharmacological properties of some medicinal plants. A3. To become familiar with the classification of medicinal plants. **B. Skills Objectives** B1. To master the skill of extracting active ingredients from medicinal plants. B2. To master the skill of computer simulation of extracted plant materials. B3. To master the skill of classifying medicinal and aromatic plants. **C. Values Objectives** C1. For the student to possess the ethics of the pharmacy profession.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	3	Introduction to pharmacology and medicinal plants	General Introduction: The Scope of Pharmacognosy, definitions and basic principles.	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam
Week 2	3	Familiarization with some pharmaceutical terminology	Drugs from natural sources, crud drugs, official and non-official drugs.	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam
Week 3	3	Understanding how to classify medicinal plants	Classification of natural products.	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam
Week 4	3	How to extract active ingredients from natural plants	Plant nomenclature and taxonomy.	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam
Week 5	3	How to determine the quality of the active ingredient	Production of crude drugs: Cultivation, collection, drying and storage.	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam
Week 6	3	Separating components and obtaining active ingredients	Deterioration of crude natural products.	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam
Week 7	3	Separating components and obtaining active ingredients	Chemistry of natural drug products.	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam
Week 8	3	Separating components and obtaining active ingredients	Quality control: Evaluation of natural products. macroscopical evaluation; physical evaluation; chemical evaluation; biological evaluation; spectroscopical evaluation.	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam
Week 9	3	Separating components and obtaining active ingredients	Phytochemical investigation of herbal products: Extraction of the plant material; Separation and isolation of	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam

			constituents; characterization of the isolated compounds.		
Week 10	3	Separation using traditional methods	Separation technique: Introduction; Mechanisms of separation and classification based on the type of technique; paper chromatography;	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam
Week 11	3	Separation using traditional methods	Thin layer chromatography; Ion-exchange chromatography; Gel filtration chromatography; Column chromatography; Gas chromatography;	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam
Week 12	3	Analyzing the chemical components present in the drug	HPLC; Electrophoresis; Affinity chromatography.	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam
Week 13	3	The principle of electrophoresis	Traditional plant medicines as a source of new drugs. Bioassay-guided fractionation	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam
Week 14	3	Separation using traditional methods	Tissue culture of medicinal plant: Introduction and history.	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam
Week 15	3	Propagation medicinal pla using mod methods	laboratory of the plant tis culture; aseptic techniq Application of the plant tis culture; environmental biological control; p growth regulators.	Presentation discussion Explanatory videos	Direct questions Student attendance Daily exam

11. Course Evaluation

1. Integrating computer programs into the practical component of Molecular Docking.
2. Integrating various websites and programs for analyzing drugs or active ingredients to keep pace with advancements in different scientific fields.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	-Trease& Evans' Pharmacognosy by William Charles Evans, 2002. -Botany : An introduction to Plant Biology, Third edditionby James D. Mauseth,2008

	-Fundamentals of Pharmacognosy and Phytotherapy by Michael Heinrich, Joanne Barnes, Simon Gibbons, and Elizabeth M. Williamson, 2004
Main references (sources)	Trease and Evans Pharmacognosy; 15th ed., 2000.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	http://www.hort.purdue.edu/newcrop/med-aro/d efault.html http://www.herbmed.org/ http://www.danish-schnapps-recipes.com/plants. html http://www.botanical.com/

1. Course Name:

Pharmacognosy II

2. Course Code:

Course number: **2210**

3. Semester / Year:

The First / Third

4. Description Preparation Date:

16\2\2026

5. Available Attendance Forms:

In presence

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

5 hours per week (3 theoretical hours and 2 practical hours) / 4 units

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

Name: Dr. Jihan alqadoori
Email: Jihan.alqadoori@mu.edu.iq

8. Course Objectives

Course Objectives	Explain the fundamental principles of phytochemistry and the chemical diversity of natural products . Classify secondary metabolites (glycosides, flavonoids, tannins) based on their structures and biosynthetic pathways.

9. Teaching and Learning Strategies

Strategy	• Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	2	introduction	General Introduction: General biosynthesis pathways of secondary metabolites	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	2	glycosides	Study of chemical classification, physical and chemical proprieties	=	=

3.	2	Cardiac glycosides	Study of cardiac glycosides.	=	=
4.	2	Saponin glycosides.	Study of saponin glycosides.	=	=
5.	2	Anthraquinone glycosides.	Study of anthraquinone glycosides.	=	=
6.	2	Phenolic glycosides.	Study of phenolic glycosides.	=	=
7.	2	Aldehyde glycosides, alcoholic glycosides.	Study of aldehyde glycosides, alcoholic glycosides.	=	=
8.	2	Flavonoid glycosides.	Study of flavonoids glycosides.	=	=
9	2	Lactone glycosides	Study of lactone glycosides	=	=
9.	2	Isothiocyanate glycosides	Study of isothiocyanate glycosides	=	=
10.	2	Alkaloids: Introduction, chemical classification , Physical and chemical properties, pharmacological effect	Study of alkaloids	=	=
11.	2	. Pyridine and piperidine alkaloids	.study of pyridine piperidine alkaloids	=	=
12.	2	Tropane alkaloids	Study of tropane alkaloids	=	=
13.	2	Imidazole alkaloids	Study of imidazole alkaloids	=	=
14.	2	Quinoline alkaloids	Quinoline alkaloids	=	=
15.	3	Iso-quinoline alkaloids	Study of Iso-quinoline alkaloids	=	=

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 40% striving (20% mid-term exam score, 20% daily preparation, daily and oral exams, and classroom activities) 60% final exam score	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	The unified evaluative curriculum for colleges of pharmacy in Iraq
Main references (sources)	Pharmacognosy JAMESE ROBBERS
Recommended books and references (scientific journals, reports...)	Pharmacognosy
Electronic References, Websites	https://scholar.google.com/

1. Course Name:
Pharmacognosy III
2. Course Code:
Course number: **2210**
3. Semester / Year:
The second / Third
4. Description Preparation Date:
2026\2\16
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
4hours per week (2 theoretical hours and 2 practical hours) / 2 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Jihan alqadoori Email: Jihan.alqadoori@mu.edu.iq
8. Course Objectives

Course Objectives	This course is intended to study the
9. Teaching and Learning Strategies	

Strategy	1) Define the principles of phytotherapy and its role in modern and traditio medicine. 2) Explain the pharmacological actions of herbal medicines based their active constituents. 3) Demonstrate role of medicinal plants in cosme and preparation of herbal formulations. 4) Apply evidence-based approache assess the efficacy, regulation and Good Manufacturing Practices (GMP) herbal medicines. • Cooperative education strategy. • Teaching strategy brainstorming. • Education strategy one minute paper. • Education strategy real time feedback • Education strategy notes series.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	2	Terpenes; terpenoids and phytosterols	General Introduction: Terpenes; terpenoids and phytosterols	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	2	Volatile oils: Introduction; chemistry of volatile oils.	Study of Volatile oils: Introduction; chemistry of volatile oils.	=	=
3.	2	Lipids: fixed oils and waxes.	Study of Lipids: fixed oils and waxes.	=	=
4.	2	Antibiotics: Natural sources; biosynthetic pathways, isolation and purification.	Study of Antibiotics: Natural sources; biosynthetic pathways, isolation and purification.	=	=
5.	2	Antibiotics derived from amino acids metabolisms	Study of. Antibiotics derived from amino acids metabolisms	=	=
6.	2	. Antibiotics derived from acetate metabolisms	Study of Antibiotics derived from acetate metabolisms	=	=
7.	2	Antibiotics derived from carbohydrate metabolisms	Study of Antibiotics derived from carbohydrate metabolisms	=	=
8.	2	Phytotherapy: Introduction, principles, medicinal plants in selected health care systems. Important natural	Study of Phytotherapy: Introduction, principles, medicinal plants in selected health care systems.	=	=

		products used in pharmacy & medicine	Important natural products used in pharmacy & medicine.		
9.	2	Nutraceutical: any substance (food or part of a food provides medical or health benefits including the prevention and treatment of disease.	Nutraceutical: any substance (food or part of a food provides medical or health benefits including the prevention and treatment of disease.	=	=
10.	2	Food supplements	Study of Food supplements	=	=
11.	2	Herbal cosmetics and cosmeceuticals	Study of Herbal cosmetics and cosmeceuticals	=	=
12.	2	Global regulations: FDA, EMA guidelines	Global regulations: FDA, EMA guidelines	=	=
13.	2	Standardization of herbal dosage forms.	Standardization of herbal dosage forms.	=	=

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 40% striving (20% mid-term exam score, 20% daily preparation, daily and oral exams, and classroom activities) 60% final exam score	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	The unified evaluative curriculum for colleges of pharmacy in Iraq
Main references (sources)	Pharmacognosy JAMESE ROBBERS
Recommended books and references (scientific journals, reports...)	Pharmacognosy
Electronic References, Websites	https://scholar.google.com/