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: 15/4/2025
File Completion Date: 04/5/2025

Signature:
Head of Department Name: Safa Azhar Razzaq
Date: Dr. Jamal Fani

Signature:
Scientific Associate Name: Noor Thamer AlSaadi / Marwa Thamer / Dr. Zainab Sattar ALi / Tammar A. Ali
Date: Dr. Jamal Fani 15/5/2025

The file is checked by:
Quality Assurance and University Performance
Director of the Quality Assurance and University Performance: Assi. Prof. Dr. Zainab Sattar ALi
Date: 15/5/2025
Signature:

Approval of the Dean

Asst. prof. Dr. Hekmat Basim mohammed

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University Name: Al-Muthanna University.
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Date:

Signature:
Scientific Associate Name:
Date:

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Quality Assurance and University Performance
Director of the Quality Assurance and University Performance:
Date:
Signature:

Approval of the Dean

1. Program Vision

Our vision is to be the prominent name that be chosen for being innovative, providing excellence of pharmacy education and scientific research, in addition to community engagement as a part of the global community of learning.

2. Program Mission

Our mission is to generate positive alteration in global pharmaceutical healthcare provision for the benefit of patients, local market, and the public by graduating knowledgeable and successful graduates, publishing impactful research, providing a supportive working environment, in addition to providing leadership both nationally and internationally.

3. Program Objectives

- ✓ To be a learning organization with a commitment to learn, adapt and change as a means to continuous improvement.
- ✓ Provide a significant leadership contribution with national and international organizations via outstanding educational, service, research programs; in addition to develop active and beneficial collaboration with organizations dedicated to healthcare improvement.
- ✓ Maintain and improve the physical environment to allow staff to pursue the strategic goals required to fulfil the mission of the college.
- ✓ Provide excellent opportunities for students to develop and acquire new skills and capacities in the conceptualization, design, conduct, analysis, interpretation and scientific communication to meet industry, hospital and community needs.
- ✓ Provide a high quality technical and vocational curriculum, aligned to regional and local businesses and community needs.
- ✓ Improve financial surplus and cash generation to provide future investment capacity.
- ✓ Collaborate with our team members, health care providers, health authorities and other stakeholders to ensure that we offer the best patient care solutions.
- ✓ Sustainably and consistently generate, lead and disseminate research of the

highest international quality with real potential for healthcare benefit and the discovery and development of medicines.

- ✓ Continue to attract and retain a talented, diverse, and dedicated staff body with each member having a clear understanding of their role in realising the mission of the college.

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	**4**	**8**		
College Requirements	**55**	**169**		
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	2
5th		Therapeutic 1	3	N/A
5th		Therapeutic 2	2	N/A
5th	527	Pharmacoeconomy	2	N/A
5th		Hospital training	N/A	4
1st	111	Human Biology	2	2
1st	115	Mathematics and Biostatistics	3	N/A
1st	127	Human anatomy	1	2
1st	129	Medical Physics	2	2
1st	127 1-	Histology	2	2
1st		Computers I	1	2
1st		Human right	2	N/A
2nd		Computers II	1	2
2nd	212	Microbiology I	3	2
2nd	222	Microbiology II	3	2
2nd		Baath crimes	1	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	2	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 technology II	3	2
4th	414	Biopharmaceutics	2	2
4th	4210	Industrial pharmacy I	3	2
5th	512	Industrial pharmacy II	3	2
5th	5212	Dosage form 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

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	429	Pharmacology III	2	N/A
4th	4	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	
		Pharmacology and Toxicology			1	
		Histology			1	
	Biology sciences	Microbiology			1	
	Food industry	Biotechnology			1	
	Pharmacy	Pharmaceutical sciences			2	
		Clinical pharmacy			1	

Lecture	Field crops	Medicinal plants			1	
	Chemistry science	Organic			1	
		Inorganic chemistry			2	
	Biology sciences	Cell physiology			1	
	Pharmacy	Pharmacology and therapeutics			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			1	
		Criminal law			1	
	Livestock	Animal production			1	
	Chemistry science Biochemistry	Inorganic chemistry			2	
		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
1st	111	Human Biology	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	115	Mathematics and Biostatistics	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Human rights	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	127	Human anatomy	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	129	Medical Physics	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	127 1–	Histology	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Computer I	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2nd	**212**	Microbiology I	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	222	Microbiology II	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Baath crimes	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Computer II	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	**429**	**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 technology II**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	
4th	**414**	**Biopharmaceutics**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	
	4210	**Industrial pharmacy I**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	
5th	**512**	**Industrial pharmacy II**	Basic	/	/	/	/	/	/	/	/	/	/	/	/	
5th	**5212**	**Dosage form 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			
				A1	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	214	Physiology I	Basic	√	√	√	√	√	√	√	√	√	√	√	√
2nd	229	Physiology II	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:
clinical pharmacy I
2. Course Code:
3. Semester /
First semester – 4th year
4. Description Preparation Date:
1/5/2025
5. Available Attendance Forms:
Attendance In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical hours - 2 practical hours / 3 units
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 c 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
second semester– 4th year
4. Description Preparation Date:
1/5/2025
5. Available Attendance Forms:
Attendance In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical hours -2 practical hours / 3 units
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 c 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 diagran 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 Disorder** -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:
1/5/2025
5. Available Attendance Forms:
Attendance In class
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: Noor Thamer Alsaadi Email: noora-thamer@mu.edu.iq
8. Course Objectives

Course Objectives	**Communication skill is one of the missi of pharmacy care practice, aims to develop a conventional relationship between pharmacist and patients, in wh information is exchanged, hold in confidence and used optimize patient care through appropriat drug therapy.**
9. Teaching and Learning Strategies	
Strategy	Teaching and learning with modern strategies

10. Course Structure

Week	Hours	Required Learning	Unit or subject name	Learning	Evaluatio

		Outcomes		method	method
1	2	Communication elements	Overview and basic principle of communication skills	Board, pictures, figures , tables	Oral and written exams
2	2	=	Non-verbal communication	=	=
3	2	Barriers	Barriers to communications	=	=
4	2	listening	Listening and empathic responding during communication.	=	=
5	2	communicatio n	assertiveness	=	=
6	2	exam	Mid term exam	=	=
7	2	Helping patients	Helping patients to manage therapeutic regimens	=	=
8	2	=	Patient counseling; counseling check list; point-by-point discussion;	=	=
9	2	evaluation	Medication safety and communication skills.	=	=
10	2	=	strategies to meet specific needs.	=	=
11	2	Conducting analysis	Communicating with children and elderly about medications.	=	=
12	2	=	Communication skills and inter-professional collaboration.	=	=
13	2	healthcare	Electronic	=	=

			communication in healthcare.		
14	2	ethics	Ethical behavior when communicating with patients.	=	=
15	2	Travel health	Travel health and health insurance	=	=

11. Course Evaluation

35% mid term exam, 5% quiz and presentations, 60% 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:

Therapeutics II

2. Course Code:

3. Semester / Year:

The second semster / 5th year

4. Description Preparation Date:

5. Available Attendance Forms:

Attendance in class

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: lecturer 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
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:

Therapeutic drug monitoring

2. Course Code:

529

3. Semester / Year:

The Second semster / 5th year

4. Description Preparation Date:

1/5/2025

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	• 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 second / fifth year

4. Description Preparation Date:

1/5/2025

5. Available Attendance Forms:

Attendance in class

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

3 theoretical hours / 3 units

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

Name: lecturer 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	Inflammatory bowel	=	=

		diseases	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:

Hospital training

2. Course Code:

3. Semester / Year:

The second semester- 5th year

4. Description Preparation Date:

1/5/2025

5. Available Attendance Forms:

Attendance in class

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

4hours per week / 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 learn everything regarding the surgical, internal, pediatric, gynecology wards and the treatment for disease.**

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	Internal medicine	Cardiovascular disease	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	4	Internal medicine	hypertension	=	=
3.	4	Internal medicine	diabetes	=	=
4.	4	Internal medicine	Heart failure	=	=
5.	4	Internal medicine	diuretics	=	=
6.	4	Internal medicine	angina	=	=
7.	4	Internal medicine	sclerosis	=	=
8.	4	Surgical ward	Surgical operation	=	=
9.	4	Surgical ward	Renal failure	=	=

10.	4	Surgical ward	asthma	=	=
11.	4	Surgical ward	Surgical operation	=	=
12.	4	Surgical ward	Intravenous fluid	=	=
13.	4	Surgical ward	Diabetic foot	=	=
14.	4	Surgical ward	appendicitis	=	=
15.	4	Surgical ward	Venous thromboembolism	=	=
16.	4	Gynecology	abortion	=	=
17.	4	Gynecology	Ectopic pregnancy	=	=
18.	4	Gynecology	Molar pregnancy	=	=
19.	4	Gynecology	Drug contraindicated in pregnancy	=	=
20.	4	Gynecology	hypertension	=	=
21.	4	Gynecology	Hemolytic disease	=	=
22.	4	Gynecology	toxoplasmosis	=	=
23.	4	Gynecology	meningitis	=	=
24.	4	Pediatric	bronchitis	=	=
25.	4	Pediatric	hepatitis	=	=
26.	4	Pediatric	gastroenteritis	=	=
27.	4	Pediatric	Chest infection	=	=
28.	4	Pediatric	Type I diabetes	=	=
29.	4	Pediatric	Heart disease	=	=
30.	4	Pediatric	Cerebral disease	=	=

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 (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)	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:

Dosage form design

2. Course Code:

5212

3. Semester / Year:

5th year/ 2nd semester

4. Description Preparation Date:

2025\4\26

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	Pre-formulation studies	=	=

		rate ,physical form Partition coefficient			
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	Excipients, flavors and Colorants	pharmaceutical and formulation consideration	=	=
9.	2	Preservatives Antioxidant s chelating agents	pharmaceutical and formulation consideration	=	=
10.	2	physical description, melting point	Pre-formulation studies	=	=
11.	2	Microscopic examination, particle size	Pre-formulation studies	=	=
12.	2	Solubility, dissolution rate, partition coefficient	Pre-formulation studies	=	=
13.	2	Stability studies, mechanism of degradation, shelf life.	Stability of drugs	=	=
14.	2	zero order reactions, first order reactions, Accelerated testing.	Stability of drugs	=	=
15.	2	Principle of absorption, distribution, metabolism and elimination	bioavailability and bioequivalence consideration	=	=

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 (30% mid-term exam score, 10% 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. 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

Course Description Form

1. Course Name:
Pharmacoeconomy
2. Course Code:
527
3. Semester / Year:
Second semester – 5th year
4. Description Preparation Date:
1/5/2025
5. Available Attendance Forms:
Attendence In class
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 understanding of the tool need to asses the cost and the outcomes of medications and pharmaceutical cares.....** **Make the students able to evaluate the pharmacoeconomics and quality of life.....** **Make the students focus on pharmaconomics 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	Pharmacoec-onomics	Overview and basic principle of oharmacoeconomics	Board, pictures, figures , tables	Oral and written exams
2	2	=	Cost analysis		

3	2	=	Cost analysis		
4	2	=	Cost analysis		
5	2	CEA	Cost effectiveness analysis		
6	2	exam	Mid term exam		
7	2	CUA	Cost utility analysis		
8	2	CBA	Cost benefit analysis		
9	2	Economic evaluation	The assessment of economic evaluation		
10	2	=	Application and cases for economic evaluation		
11	2	Conducting analysis	Drug focused analysis		
12	2	=	Disease focused aanalysis		
13	2	introduction	epidemiology		
14	2	CMA	Cost minimization analysis		
15	2	discounting	The discounting calculation		

11.Course Evaluation

35% mid term exam, 5% quiz and presentations, 60% final exam

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Bootman JL
Main references (sources)	Townsend RJ, principle of pharmacoeconomics
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://scholar.google.com/

Course Description

1. Course Name:
Pharmaceutical calculation
2. Course Code:
128
3. Semester / Year:
1st year/ 2nd semester
4. Description Preparation Date:
27/4/2025
5. Available Attendance Forms:
Attendance in class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical hours /2 practical hours / 3 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 form** • **pharmaceutical formulations of extemporaneous compound biological parameters of** • **drug substances. The course teaches calculations for dilu concentration of different** • **types of liquids and those involved in preparing isotonic 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	H	Required Learning	Unit or subject	Learning	Evaluation method

	ours	Outcomes	name	method	
5 week	10	Dilution an concentrati n of pharmaceu al preparatio	Dilution and concentra on of pharmace ical preparati s. 1	Blackbo d, vid pictures diagram PowerP nt lectu	Final exam, mid tern daily and oral exa ms
6,7,8	6	Isotonic solutions.	Isotonic solutions.	=	=
9,10,11	6	Electrolyte solutions (milliequiv ents, millimoles and milliosmole	Electrolyt solutions (milliequi lents, millimole and milliosmo s)	=	=
12,13,1 15	8	Constitutec solutions, I admixtures and flow ra calculation	Constitute solutions, I.V admixture and flow rate calculatio .	=	=

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 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

1. Course Name:
Physical pharmacy I
2. Course Code:
213
3. Semester / Year:
First semester/ second year
4. Description Preparation Date:
2/5/2025
5. Available Attendance Forms:
Attendance In class
6. Number of Credit Hours (Total) / Number of Units (Total)
3hours theoretical- 2 hours practical / 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	
Objectives:	**To understand the application of quantitative and theoretical principles of the physic characters of matter in the practice of pharmacy. It aids the pharmacists in their attempt to predict the solubility, compatibility and biological activity of drug products. As a result of this knowledge it will help in the developme of new drugs and dosage forms as well as in improvement of various modes of administration**

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	State of matter and bonds between	State of matter	Board, powe point,	Mid-final exam

		molecules		pictures, diagrams, graphs	Oral exams
2	3	Gases, liquids, solids a crystalline properties	Gases,liquids, solidsand crystallin properties		
3	3	Phase equilibria, phase rule and thermal analysis	Phase equilibria, phase ru thermal analysis		
4	3	Thermodynamics, First law	Thermodynamics, First law		
5	3	Thermochemistry, second law	Thermochemistry, second law		
6	3	Free energy	Free energy		
7	3	Solution of non electrolytes	Solution of non electrolytes		
8	3	Ideal and real solution	Ideal and real solutions		
9	3	Colligative properties	Colligative properties		
10	3	Solutions of electrolyt	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

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

Course Description

1. Course Name:
Physical pharmacy II
2. Course Code:
228
3. Semester / Year:
Second/ second year
4. Description Preparation Date:
1/5/2025
5. Available Attendance Forms:
In class
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours 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
• **To understand the solubility process and the physical properties of** • **molecules, the activirty of the prodrug, the methods of developments** • **of new drugs and the modes of administrations.**
9. Teaching and Learning Strategies

Strategy	Learning and teaching in cooperative education. Brainstorming strategy.

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	3	Solubilityand disturbution proce solubility of gases liquids,	Solubilityand disturbution process, solubility of gas in liquids	Power point, whiteboard pictures, figures.	Oral exam quizes written fi exams

2	3	Solubility of liqui in-liquids, solubil of solids in liquids	Solubility liquids in-liqui solubility of solids in liqui		
3	3	Solids disturbution liquid solvents	Solids disturbution liquid solvents		
4	3	Kinetics, rate a orders of reactions	Kinetics, rate a orders reactions		
5	3	Influence temperature decomposition medicinal agents.	Influence temperature decomposition medicinal agen		
6	3	Accelerated stabil analysis	Accelerated stabil analysis		
7	3	Complexation phenomena	Complexation phenomena		
8	3	The analysis a thermodynamic treatment of stabil constant.	The analysis a thermodynamic treatment of stabil constant.		
9	3	Interfacial,liquid interface phenomer Surface free energy	Interfacial phenome liquid interface, surfa free energy		
10	3	Colloids, dispers systems, types colloidal systems	Colloids, dispers systems, types colloidal systems		
11	3	Zeta potent diffusion, solubilization	Zeta potenti diffusion, solubilizati		
12	3	Micrometrics	Particle size, metho of particle-s reduction,particle shape and surface are		
13	3	Rheology, Newtonian system,	Thixotropy, negative thexotropy		

14	3	Rheology	Determination thixotropy		
15	3	polymer	Pharmaceutical polymers		

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	

Course Description

1. Course Name:
Principles of pharmacy
2. Course Code:
112
3. Semester / Year:
First year/ 1 st semester
4. Description Preparation Date:
26/4/2025
5. Available Attendance Forms:
Attendance in class
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: 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-term

				PowerPoint lecture	exam daily and c exam
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 specific volume	Density, specific gravity and specific volume	=	=
12,13,14	6	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 textbooks (curricular boc if any)	Pharmaceutical calculation by ansal haward
Main references (sources)	Pharmaceutical Calculation by Stoklosa
Recommended books and references (scientific journals, reports…)	Pharmaceutical Calculation by Stoklosa
Electronic References, Websites	https://scholar.google.com

Course Description

1. Course Name:
Pharmaceutical technology I
2. Course Code:
313
3. Semester / Year:
3nd year/ 1st semester
4. Description Preparation Date:
1/5/2025
5. Available Attendance Forms:
Attendance in the class
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	**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		Dispersed	Blackbo	Final exam, m

		Dispersed syster their classificatic comparisons between differe system	systems: th classification; comparisons between differe system	d, vid pictures diagram PowerP nt lectur	term exam, da and oral exams
2	2	Solution and type of solution	Solution and types of solutio	=	=
3	4	Solubility: Factor affecting solubilit expression of dissolution; dissolution rate versus solubility; preparation of solutions containing non-volatile materials.	Solubility: Facto affecting solubility; expression of dissolution; dissolution rate versus solubility preparation of solutions containing non-volatile materials.	=	=
4,5	4	Official solutions; classification of official solutions; preparation and uses.	Official solution classification of official solution preparation and uses.	=	=
6	4	Aqueous solution contain aromatic principles; aromatic waters; methods of preparations; stability.	Aqueous sol. contains aroma principles; aromatic waters methods of preparations; stability.	=	=
7,8	4	Syrups: sugar based syrups; artificial and sorbitol based syrups; stability of syrup	Syrups: sugar based syrups; artificial and sorbitol based syrups; stability of	=	=

			syrups.		
9	3	Definition and methods of clarification; filte aids in clarificatic	Definition and methods of clarification; filt aids in clarification.	=	=
10	3	Preparation of solutions using mixed solvent systems; spirits, and elixirs.	Preparation of solutions using mixed solvent systems; spirits and elixirs.	=	=
11	3	Extraction; maceration and percolation.	Extraction; maceration and percolation.	=	=
12	4	Tinctures; fluid extracts; extracts resins and oleoresins	Tinctures; fluid extracts; extract of resins and oleoresins	=	=
12,1	6	Colloidal dispersions; lyophilic; lyophol	Colloidal dispersions; lyophilic; lyophobic	=	=
14,1	6	Coarse dispersion suspensions	Coarse dispersion; suspensions	=	=

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 any)	Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition. and Sprowe American Pharmacy.
Main references (sources)	Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition Sprowe American Pharmacy.
Recommended books and references	Pharmaceutical Dosage Forms - Tablets: Unit Operati and Mechanical Properties

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

Course Description

1. Course Name:
Pharmaceutical technology II
2. Course Code:
328
3. Semester / Year:
3rd year/ 2nd semester
4. Description Preparation Date:
27/4/2025
5. Available Attendance Forms:
Attendance in class
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	**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	10	Emulsions;	Emulsions;	Blackbo	Final exam, m

		purpose of emulsification; methods of emulsification; emulsifying agen HLB syste stability emulsions.	purpose of emulsification; methods of emulsification; emulsifying agents; H system; stabil of emulsions.	d, vid pictures diagram PowerP nt lectur	term exam, da and oral exams
4,5	5	Lotions; liniment and collodions.	Lotions; linimer and collodions.	=	=
6,7	6	Suppositories.	Suppositories.	=	=
8,9,1	10	Powdered dosage forms	Powdered dosa forms	=	=
11,1 13	10	Semisolid dosage forms.	Semisolid dosag forms.	=	=
14,1	4	Incompatibilities pharmaceutical dosage forms	Incompatibilitie in pharmaceuti dosage forms	=	=

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 textbo (curricular books, any)	Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition. and Sprowel's Americ Pharmacy.
Main referen (sources)	Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition Sprowel's American Pharmac
Recommended books and references (scientific	pharmaceutical Dosage Forms and Drug Delivery.

journals, reports…)	
Electronic Referenc Websites	https://scholar.google.com

1. Course Name:

pharmaceutical biotechnology

2. Course Code:

5213

3. Semester / Year:

2nd semester/ 5th year

4. Description Preparation Date:

2/5/2025

5. Available Attendance Forms:

Attendance in class

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/

1. Course Name:

Applied Biopharmaceutics

2. Course Code:

414

3. Semester / Year:

1st year/ 1st semester

4. Description Preparation Date:

28/4/2025

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: lecturer 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, PowerPoint lecture	Final exam, mid-term exam, daily 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 II
2. Course Code:
512
3. Semester / Year:
1st semester/ 5th year
4. Description Preparation Date:
26/4/2025
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: 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	Quality control	=	=
3.	3	Dosage form	Type of tablet	=	=
4.	3	coating	Type of coating	=	=
5.	3	capsule	Hard capsule	=	=
6.	3	Soft gelatin capsule	Manufacturing method	=	=
7.	3	Micro-encapsulation	Core and coating material	=	=

8.	3	Sustained release	Theory and concept	=	=
9.	3	liquid	stability	=	=
10.	3	suspension	Theory, formulation	=	=
11.	3	emulsion	Types,formulation	=	=
12.	3	suppository	Uses, different types	=	=
13.	3	aerosol	propellant	=	=
14.	3	aerosol	stability	=	=
15.	3	aerosol	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 I

2. Course Code:

4210

3. Semester / Year:

2nd semester/ 4th year

4. Description Preparation Date:

26/4/2025

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: 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	solubility	=	=
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/

Course Description Form

1. Course Name:
Medical terminology
2. Course Code:
116
3. Semester / Year:
First Semester /First stage
4. Description Preparation Date:
22-4-2025
5. Available Attendance Forms:
In presence
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: Ahmed Adeeb Mohamed Email: ahmedadeeb57@mu.edu.iq
8. Course Objectives

Course Objectives	**In this course, students will learn to pronoun spell, and define medical and pharmaceutical ter used in health care settings. It will use a wo building strategy that helps them disco connections and relationships among word roo 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 common suffixes	Basic word roots and comm suffixes	White board, video, pictures, diagrams,	Final exam, mid-t exam, daily and exams

				PowerPoint lecture	
2	1	More word roots, suff and prefixes related pharmaceutical sciences1	More word roots, suffixes prefixes related pharmaceutical sciences1		
3	1	More word roots, suff and prefixes related pharmaceutical sciences2	More word roots, suffixes prefixes related pharmaceutical sciences2		
4	1	Basic anatomical terms abnormal conditions	anatomical terms		
5	1	Male and female ge medical terms	The genitals and urinary t		
6	1	Oral cavity and diges tract	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 developm and 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	1				

11. Course Evaluation

5 marks Quizzes and scientific activities and attendance+ 35 marks Midterm exam+ 60 marks Final exam.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
Physiology I
2. Course Code:
214
3. Semester / Year:
The first Semester / Second stage
4. Description Preparation Date:
2025-4-22
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
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	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, practical 20% which include 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)	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 Semester / Second stage
4. Description Preparation Date:
22-4-2025
5. Available Attendance Forms:
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. Zainab Sattar Ali Email: zainbsatarali@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.		

13. 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, practical which includes 20% daily preparation, daily and oral exams, and classroom activities) 60% final exam score	
14. 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

11. Course Name:
Clinical Toxicology
12. Course Code:
443
13. Semester / Year:
The first Semester / Fifth stage
14. Description Preparation Date:
2025/5/1
15. Available Attendance Forms:
In presence
16. Number of Credit Hours (Total) / Number of Units (Total)
4 hours per week (2 theoretical hours and 2 practical hours) / 3 units
17. Course administrator's name (mention all, if more than one name)
Name: : zainab abdlkadhim Email: zainab.abdlkadhim@mu.edu.iq

18. 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.

19. Teaching and Learning Strategies

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

20. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
16.	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
17.	2	Over the counter drugs; caffeine; theophylline.	Drug Toxicity	=	=
18.	2	Antihistamine,	Drug Toxicity	=	=

		decongestant; vitamins.			
19.	2	rdiovascular drugs; beta blockers; ACE nhibitors; Digoxin.	Prescription Medications	=	=
20.	2	Calcium channel blocker; Antiarrhythmic agents.	Prescription Medications	=	=
21.	2	hypoglycemic drugs	Prescription Medications	=	=
22.	2	Mid exam	----------	=	=
23.	2	Opiods; CNS anti-cholinergic phenothiazines	Prescription Medications	=	=
24.	2	Drug of Abuse	Opioids; Cocaine; phencyclidine.	=	=
25.	2	Drug of Abuse	marijuana; Lysergic acid.	=	=
26.	2	Chemical and Environmental Toxins	Hydrocarbons	=	=
27.	2	Chemical and Environmental Toxins.	Antiseptic; Disinfectants	=	=
28.	2	Chemical and Environmental Toxins	Camphor; moth repellents	=	=
29.	2	Botanicals and plants-derived toxins	Herbal preparation; Toxic plants	=	=
30.	2	Botanicals and plants-derived toxins	Poisonous mushrooms	=	=

15. 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

16. 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 Ethics
2. Course Code:
3211
3. Semester / Year:
The second semester / third stage
4. Description Preparation Date:
22-4-2025
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	The pituitary gland	=	=
3.	1	Code of Ethics Pharmacists.	The thyroid gland	=	=
4.	1	Common Ethical Considerations in Pharmaceutical Care Practice	(Beneficence, Autonomy, non-maleficience)	=	=

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.	misuse 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.	=	=

17. Course Evaluation

5 marks Quizzes and scientific activities and attendance+ 35 marks Midterm exam+ 60 marks Final exam.

18. 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/

Course Description Form

1. Course Name:
Pharmacology II
2. Course Code:
411
3. Semester / Year:
First semester/ Fourth stage
4. Description Preparation Date:
22-4-2025
5. Available Attendance Forms:
The attendance during the lecture
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/ Fourth stage
4. Description Preparation Date:
22-4-2025
5. Available Attendance Forms:
The attendance during the lecture
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.	Hormones of the pituitary and thyroid glands	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		Insulin and oral hypoglycemic drugs		
3	2		Insulin and oral hypoglycemic drugs		
4	2		Estrogens and Androgens		
5	2		Estrogens and Androgens		
6	2		Corticosteroids		
7	2		Drugs affecting bone metabolism		
8	2		Anti-inflammatory, Antipyretic, and analgesic agents		
9	2		Anti-inflammatory, Antipyretic, and analgesic agents		
10	2		Biological therapies in rheumatoid arthritis		
11	2		Other drugs for rheumatoid arthritis; Drugs employed in the treatment of gout		

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+ 35 marks Midterm exam+ 60 marks Final exam.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	المنهج الموحد للامتحان التقويمي لكليات الصيدلة للعام الدراسي 2023-2024 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:

General Toxicology

2. Course Code:

429

3. Semester / Year:

The second semester/ Fourth stage

4. Description Preparation Date:

22-4-2025

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

8. Course Objectives

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.

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 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	Target organs a systemic toxicology	Liver	=	=
7.	2	Target organs a 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).	=	=

19. 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

20. Learning and Teaching Resources

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/

1. Course Name:
Clinical Toxicology
2. Course Code:
516
3. Semester / Year:
The first semester / Fifth stage
4. Description Preparation Date:
22−4−2025
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: : 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,	General Toxicology	Blackboard, video, pictures, diagrams,	Final exam, mid-term exam, daily

		pediatric poisoning and geriatric patient		PowerPoint lecture	and oral exams
2.	2	Over the counter drugs; caffeine; theophylline.	Drug Toxicity	=	=
3.	2	Antihistamine, decongestant; vitamins.	Drug Toxicity	=	=
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	Hydrocarbones	=	=
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, 20% practical part which include daily preparation, 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:

Pharmacognosy I

2. Course Code:

Course number: **2210**

3. Semester / Year:

The second / The second year

4. Description Preparation Date:

16/2/2025

5. Available Attendance Forms:

In presence

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

4 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	This course is intended to study the scope of pharmacognosy, Medicinal plant definitions and basic principles. nomenclature, classification of natural products, phytochemistry which include extraction and Drugs from natural sources, crud drugs, official and non- isolation of active constituents from natural sources.

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	Scope of Pharmacognosy	General Introduction: The Scope of Pharmacognosy	Whiteboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	3	Official and non-official Pharmacognosy	Study of official and non- official Pharmacognosy	=	=
3.	3	Classification of natural products.	Study of Classification of natural products.	=	=
4.	3	Plant nomenclature and taxonomy.	Study of Plant nomenclature and taxonomy.	=	=
5.	3	Production of crude drugs: Cultivation,	Study of Production of crude drugs:	=	=

		collection, drying and storage.	Cultivation, collection, drying and storage.		
6.	3	Deterioration of crude natural products.	Study of Deterioration ofcrude natural products.	=	=
7.	3	Chemistry of natural drug products.	Study of Chemistry of natural drug products.	=	=
8.	3	Quality control: Evaluation of natural products; macroscopical evaluation; physical evaluation; chemical evaluation; biological evaluation; spectroscopical evaluation.	Study of the Quality control: Evaluation of natural products; macroscopical evaluation; physical evaluation; chemical evaluation; biological evaluation; spectroscopical evaluation.	=	=
9.	3	Separation technique	Study of Separation technique	=	=
10.	3	Introduction; Mechanisms of separation and classification based on the type of technique; paper chromatography; Thin layer chromatography; Ion-exchange chromatography	Study of Introduction; Mechanisms of separation and classification based on the type of technique; paper chromatography; Thin layer chromatography; Ion-exchange chromatography	=	=
11.	3	Gel filtration chromatography; Column chromatography	Study of Gel filtration chromatography; Column chromatography	=	=
12.	3	Gas chromatography; HPLC; Electrophoresis;	Study of Gas chromatography; HPLC; Electrophoresis;	=	=

		Affinity chromatography.	Affinity chromatography.		
13.	3	Traditional plant medicines as a source of new drugs. Bioassay-guided fractionation	Study of Traditional plant medicines as a source of new drugs. Bioassay-guided fractionation	=	=
14.	3	Tissue culture of medicinal plant: Introduction and history; laboratory of the plant tissue culture; aseptic techniques	Study of Tissue culture of medicinal plant: Introduction and history; laboratory of the plant tissue culture; aseptic techniques	=	=
15.	3	Application of the plant tissue culture; environmental and biological control; plant growth regulators.	Study of Application of the plant tissue culture; environmental and biological control; plant growth regulators.	=	=

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% including practical and 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)	Trease and Evans. Pharmacognosy. 15th ed., 2000
Recommended books and references (scientific journals, reports...)	Pharmacognosy JAMESE ROBBERS
Electronic References, Websites	https://scholar.google.com/

1. Course Name:

Pharmacognosy II

2. Course Code:

312

3. Semester / Year:

The first / The third year

4. Description Preparation Date:

2025/2/16

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)/Theory 2 units + Laboratory 1 unit

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

Name: Dr. Jamel Hasoni Fani
Email: j.fani.agr@mu.edu.iq

8. Course Objectives

Course Objectives	• To enable students to identify medicinal plants, their parts, methods of diagnosis, examine plant tissues under a microscope, and learn about all sources of natural products and crude medicines. • To enable students to learn about the most important extraction methods for active substances and methods for dissolving them using multiple solvents and reagents based on the properties of plants. • The subject also aims to develop and refine students' scientific skills and give them appropriate experiences to make them ready to work in the fields of pharmaceutical drug manufacturing and prepare them to be distinguished researchers in the future.

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	Biosynthesis of drugs	Introduction: General biosynthesis pathways of secondary metabolites	Whiteboard, video, pictures, diagrams, PowerPoint	Final exam, mid-term exam, daily and oral exams

				lecture	
2.	2	Secondary metabolites drugs	Carbohydrates	=	=
3.	2	Glycosides drugs	Biosynthesis, physical and chemical properties	=	=
4.	2	Glycosides drugs	Glycosides: cardiac, saponin, anthraquinone	=	=
5.	2	Glycosides drugs	Glycosides: flavonoid, cyanophore isothiocyanate	=	=
6.	2	Glycosides drugs	Glycosides: aldehyde, alcoholic, phenolic	=	=
7.	2	Glycosides drugs	Glycosides: lactone, coumarins, chromones	=	=
8.	2	Resins and tannins	Resins and resin combination, and tannins	=	=
9.	2	Lipid drugs	Fixed oils and waxes	=	=
10.	2	Volatile oil drugs	Introduction; chemistry of volatile oils, biosynthesis of volatile oils	=	=
11.	2	Volatile oil drugs	Hydrocarbons as volatile oils, alcohols as volatile oils, and aldehydes as volatile oils	=	=
12.	2	Volatile oil drugs	Ketones as volatile oils, phenols as volatile oils, oxides as volatile oils	=	=
13.	2	Volatile oil drugs	Ester as volatile oils, phenolic ethers as volatile oils	=	=
14.	2	Toxic plants	Non-medicinal toxic plants	=	=
15.	2	Vitamins and amino acids	Vitamins and amino acids	=	=

13. 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% including practical and daily preparation, daily and oral exams, and classroom activities)

60% final exam score

14. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	The unified evaluative curriculum for colleges of pharmacy in Iraq
Main references (sources)	Robbers, J.E., Speedie, M.K., & Tyler, V (1996). Pharmacognosy a pharmacobiotechnology. (No Title).
Recommended books and references (scientific journals, reports...)	Evans, W.C. (2009). Trease and Eva pharmacognosy. Elsevier Health Sciences.
Electronic References, Websites	https://scholar.google.com/

1. Course Name:
Pharmacognosy III
2. Course Code:
3210
3. Semester / Year:
The second / The third year
4. Description Preparation Date:
2025/2/16
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)/Theory 2 units + Laboratory 1 unit
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Jamel Hasoni Fani Email: j.fani.agr@mu.edu.iq
8. Course Objectives

Course Objectives	• This course is intended to study chemistry of other natural products namely alkaloids and antibiotics. • Also this course includes studying phytotherapy and tissue culture techniques utilized for production of natural 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	Alkaloids	Introduction; Physical and chemical properties.	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	2	Alkaloids	Pyridine, piperidine alkaloids.	=	=
3.	2	Alkaloids	Tropane alkaloids.	=	=
4.	2	Alkaloids	Quinoline tropan alkaloids.	=	=
5.	2	Alkaloids	Iso-quinoline alkaloids.	=	=
6.	2	Alkaloids	Imidazole alkaloids.	=	=
7.	2	Alkaloids	Indole alkaloids.	=	=

8.	2	Alkaloids	Steroidal alkaloids	=	=
9.	2	Alkaloids	Lupinane alkaloids.	=	=
10.	2	Alkaloids	Alkaloidal amines.	=	=
11.	2	Alkaloids	Purine alkaloids.	=	=
12.	2	Antibiotics	Natural sources.	=	=
13.	2	Antibiotics	Biosynthetic pathways, isolateion and purification.	=	=
14.	2	Phytotherapy	Introduction, principles, medicinal plants in selected health care systems.	=	=
15.	2	Phytotherapy	Important natural products and phytomecines used in pharmacy and medicine.	=	=

15. 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% including practical and daily preparation, daily and oral exams, and classroom activities)
60% final exam score

16. Learning and Teaching Resources

Required textbooks (curricular books, if any)	The unified evaluative curriculum for colleges of pharmacy in Iraq
Main references (sources)	Robbers, J.E., Speedie, M.K., & Tyler, V (1996). Pharmacognosy & pharmacobiotechnology. (No Title).
Recommended books and references (scientific journals, reports...)	Heinrich, M., Barnes, J., Prieto-Garcia, Gibbons, S., & Williamson, E. (2017). *Fundamentals of pharmacognosy & phytotherapy E-BOOK*. Elsevier Health Science
Electronic References, Websites	https://scholar.google.com/

Course Description Form

1. Course Name:
Analytical Chemistry
2. Course Code:
113
3. Semester / Year:
Semester 1/ 1st first
4. Description Preparation Date:
20/4/2025
5. Available Attendance Forms:
Full-time (in attendance)
6. Number of Credit Hours (Total) / Number of Units (Total)
3h. Theory+2 h. practical/ 4
7. Course administrator's name (mention all, if more than one name)
Name: haider abdulameer abdulhadi Email: haiderchemist@mu.edu.iq

8. Course Objectives	
Course Objectives	1. To provide students with a sound theoretical background in chemical principles is essential to practice chemical analysis. 2. To understand the importance of judging the accuracy and precision experimental data and techniques of quantitative analysis. 3. To show that theory frequently serves as a useful guide to the solution of analyt problems.

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	Review of elementary concepts important to analytical chemistry	Strong and weak electrolytes	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
2nd	3	Review of elementary concepts important to analytical chemistry. The evaluation of analytical data.	Important weight and concentration units. Definition of terms.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
3ed	3	An introduction to gravimetric analysis	Statistical analysis of data rejection of data	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
4th	3	An introduction to gravimetric analysis	Precipitation methods	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
5th	3	An introduction to gravimetric analysis	Gravimetric factor	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
6th	3	The scope of applications of gravimetric analysis	The scope of applications gravimetric analysis; Inorganic precipitating agents.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
7th	3	The scope of applications of gravimetric analysis An introduction to volumetric methods of analysis.	Organic precipitating ager Volumetric calculations.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
8th	3	An introduction to volumetric methods of analysis.	Acid-base equilibria and p calculations.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
9th	3	Buffer solutions	Theory of neutralization titrations of a simple syste	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
10th	3	Theory of neutralization titrations	Titrations of a complex system; Precipitation titrations.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz

11th	3	Calculation of pH in a complex system	Volumetric methods are based on a complex syster	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid = final) Exams with Quizz
12th	3	Equilibria in oxidation-reduction system; theory oxidation-reduction titrations.	Redox Reactions; Coupled Equilibria; Solubility Equilibria	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid = final) Exams with Quizz
13th	3	Equilibria in oxidation-reduction system; theory oxidation-reduction titrations.	The principles of redox titration; Applications of t principles of redox titratio in pharmacy	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid = final) Exams with Quizz
14th	3	Spectrophotometric anal	An introduction to optical methods of analysis; Methods based on absorption of radiation.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid = final) Exams with Quizz
15th	3	Exam	Exam		

11. Course Evaluation

Midpoints are 40 come from:

15 points theory exam + 5 points for quizzes, and presentations.

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)	Fundamentals of Analytical Chemistry by Stook and We
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Organic Chemistry I
2. Course Code:
1210
3. Semester / Year:
Semester 2/1st first
4. Description Preparation Date:
20/4/2025
5. Available Attendance Forms:
Full-time (in attendance)
6. Number of Credit Hours (Total) / Number of Units (Total)
3h. Theory+2 h. practical/ 4
7. Course administrator's name (mention all, if more than one name)
Name: haider abdulameer abdulhadi Email: haiderchemist@mu.edu.iq
8. Course Objectives

Course Objectives	1. To enable students to understand the chemistry of carbon and the classification, properties, and reactions of organic compounds. 2. It includes understanding the basic structure and properties of alkanes, alkenes, and alkynes, in addition to the principles of stereochemistry and features of aromatic 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	Introduction	Introduction in organic chemistry	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
2nd	3	Alkanes and methane	Nomenclature; Classification; Isomerism Methods of preparation; Chemical properties	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
3ed	3	Alkanes and methane	Nomenclature; Classificati Isomerism Methods of preparation; Chemical properties	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
4th	3	Alkenes I and II, Alkynes and dienes.	Naming Alkenes and Alkynes; The Structure of Alkenes: Cis–Trans Isomerism	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
5th	3	Alkenes I and II, Alkynes and dienes.	Properties of Alkenes and Alkynes	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
6th	3	Alkenes I and II, Alkynes and dienes.	Types of Organic Reaction Addition Reactions of Alkenes	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
7th	3	Stereochemistry I & II	Stereoisomers; Chirality; (and (S) Nomenclature	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
8th	3	Stereochemistry I & II	Depicting Asymmetric Carbons; Diastereomers; Fischer Projections	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
9th	3	Stereochemistry I & II	Stereochemical Relationships; Optical Activity; Resolution of Enantiomers	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
10th	3	Alcohols and ethers	Alcohol and ether functional groups; The IUPAC system for naming alcohols and ethers; Important physical properties.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz

11th	3	Alcohols and ethers	Major chemical reaction of alcohols; Predict the products of dehydration and oxidation reactions; The thiol functional group	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
12th	3	Alkyl halides	IUPAC Nomenclature; Preparation of Alkyl Halid Mechanism of the Reactio Alcohols with Hydrogen Halides.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
13th	3	Alkyl halides	The SN1 Mechanism; The SN2 Mechanism	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
14th	3	Cycloalkanes	Cycloalkanes	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative And Summative Evaluation (Mid + final) Exams with Quizz
15th	3	Exam	Exam		

11. Course Evaluation

Midpoints are 40 come from:
15 points theory exam + 5 points for quizzes, and presentations.
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)	• Organic Chemistry by Robert T. Morrison and Robert N. Boyd. • Organic Chemistry by McCurry; 5th ed. Thomason learning; CA,USA; 2000.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Organic Chemistry II
2. Course Code:
211
3. Semester / Year:
First semester/ 2nd second
4. Description Preparation Date:
20/4/2025
5. Available Attendance Forms:
Full-time (in attendance)
6. Number of Credit Hours (Total) / Number of Units (Total)
3h. Theory+2 h. practical/ 4
7. Course administrator's name (mention all, if more than one name)
Name: Farah jameel hassan Email: chemfrh@mu.edu.iq
8. Course Objectives

Course Objectives	**Study of stereochemistry and how to prepare a name 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
1-2	**6**	Aromatic Hydrocarbons (includes benzene, electrophilic aromatic substitution, arenas and the derivatives).	Aromatic Hydrocarbons (includes benzene, electrophilic aromatic substitution, arenas and thei derivatives).	Oral and written exams	**Lectures**

3-4	**5**	Carboxylic acids: properties and reactions	Carboxylic acids: properties and reactions	Oral and written exams	**Lectures**
5-6	7	Functional derivatives of carboxylic acids.	Functional derivatives of carboxylic acids.	Oral and written exams	**Lectures**
7-8	6	Amines I and II	Amines I and II	Oral and written exams	**Lectures**
9-12	12	Aldehydes and ketones (include also aldol and Claisen condensation); Classification, reactions and properties.	Aldehydes and ketones (include also aldol and Claisen condensation); Classification, reactions and properties.	Oral and written exams	**Lectures**
13-15	5	Phenols.	Phenols.	Oral and written exams	**Lectures**

11. Course Evaluation

Midpoints are 40 come from:
15 points theory exam + 5 points for quizzes, and presentations.
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)	
Main references (sources)	Organic Chemistry by Robert T. Morrison and .Robert N. Boyd Organic Chemistry by McCurry; 5th ed. Thomason learning; CA,USA; 2000
Recommended books and references (scientific journals, reports…)	Organic Chemistry by Robert T. Morrison and Robert N. Boyd Organic Chemistry by McCurry; 5th ed. Thomason learning; CA,USA; 2000 An introduction to the chemistry of heterocyclic compound by Acheson, R. M.latest ed
Electronic References, Websites	

Course Description Form

1. Course Name:
Organic chemistry III
2. Course Code:
226
3. Semester / Year:
Second semester/ 2nd second
4. Description Preparation Date:
20/4/2025
5. Available Attendance Forms:
Full-time (in attendance)
6. Number of Credit Hours (Total) / Number of Units (Total)
2h. Theory+2 h. practical/ 3
7. Course administrator's name (mention all, if more than one name)
Name: Farah jameel hassan Email: chemfrh@mu.edu.iq

8. Course Objectives

Course Objectives	**Active ingredients used in pharmaceutical formulations** **Extraction, isolation and preparation methods** **Chemical structures of drugs and treatments** **Its medical and therapeutic uses** **Effects and changes on chemical compounds t increase the effectiveness of drugs**

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

1-2	**5**	Heterocyclic system: Class of heterocyclic systems; general structures; properti Occurrence in nature and i medicinal products	Heterocyclic system: Class of heterocyclic systems; general structures; propertie Occurrence in nature and in medicinal products	Oral and written exams	**Lectures**
3	**3**	Five-membered ring heterocyclic compounds: pyrrole; furan and thiopher .	Five-membered ring heterocyclic compounds: pyrrole; furan and thiophen .	Oral and written exams	**Lectures**
4	2	Source of pyrrole, furan and thiophen.	Source of pyrrole, furan and thiophen.	Oral and written exams	**Lectures**
5-6	5	Electrophilic substitution in pyrrole, furan and thiophen: Reactivity and orientation.	Electrophilic substitution in pyrrole, furan and thiophen: Reactivity and orientation.	Oral and written exams	**Lectures**
7-8	4	Six-membered ring heterocyclic compounds: Structure & reactions of pyridine.	Six-membered ring heterocyclic compounds: Structure & reactions of pyridine.	Oral and written exams	**Lectures**
9-11	6	Saturated five-membered heterocyclic compounds	Saturated five-membered heterocyclic compounds	Oral and written exams	**Lectures**
12-15	5	Heterocyclic of five & six member rings with two & three heteroatoms.	Heterocyclic of five & six member rings with two & three heteroatoms.		

11. Course Evaluation

Midpoints are 40 come from:
15 points theory exam + 5 points for quizzes, and presentations.
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)	
Main references (sources)	heterocyclic compound by Acheson, M.latest ed
Recommended books and references (scientific journals, reports…)	Organic Chemistry by Robert T. Morrison and Robert N. Boyd Organic Chemistry by McCurry; 5th ed. Thomason learning; CA,USA; 2000 An introduction to the chemistry of heterocyclic compound by Acheson, R. M.latest ed
Electronic References, Websites	

Course Description Form

1. Course Name:
Inorganic Pharmaceutical Chemistry
2. Course Code:
311
3. Semester / Year:
Semester 1/ 3rd third
4. Description Preparation Date:
20/4/2025
5. Available Attendance Forms:
Full-time (in attendance)
6. Number of Credit Hours (Total) / Number of Units (Total)
2h. Theory+2 h. practical/ 3
7. Course administrator's name (mention all, if more than one name)
Name: Rusul Yahya Jasim Alabada Email: Dr.Rusul.Alabada@mu.edu.iq
8. Course Objectives

Course Objectives	1. To present a review of the principles of inorganic chemistry that apply medicinal and /or pharmaceutical chemistry. 2. To understand atomic and molecular structures, an explanation of ato structures, and the relationship with binding forces and complexation. 3. It also describes inorganic products used as pharmaceutical preparations diagnostic tools.

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	Atomic and molecular structure/Complexation	Electronic structure of atoms; Atomic orbitals; Ionization; Electronic structure of molecules	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
2nd	2	Atomic and molecular structure/ Complexation	Coordination compounds and complexation; Oxidation numbers; Electron configuration of metals in complexes	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
3rd	2	Atomic and molecular structure/ Complexation	Orbital hybridization; Properties of ligands; Bonding in complexes; Valence Bond Theory (VB	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
4th	2	Essential and trace ions	Iron; Copper; Sulfur	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
5th	2	Essential and trace ions Non-essential ions	Iodine. Fluoride, Bromide, Lithiu	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
6th	2	Non-essential ions Gastrointestinal agents.	Gold, Silver; Mercury. Acidifying agents.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
7th	2	Antacids	Principle of antacids; Anta types; Antacid drugs	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
8th	2	Protective adsorbents Dental agents	Introduction of protective adsorbents; Most product for the treatment Introduction of dental agents; Anticaries agents; Polishing agents; Desensitizing agents	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
9th	2	Topical agents	Principles of topical thera Protectives; Antimicrobia and astringents	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
10th	2	Radiopharmaceutical preparations	Definition of a radiopharmaceutical; Idea Radiopharmaceutical	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz

11th	2	Radiopharmaceutical preparations	Types of radiopharmaceuticals; Methods of production of radiopharmaceuticals	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
12th	2	Radiopharmaceutical preparations	Mathematical considerati of radioactive decay	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
13th	2	Radio opaque and contras media	Radiographic contrast; Ty of contrast media	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
14th	2	Radio opaque and contras media	Methods of administratio contrast material; Special grams''; Contrast media fo special procedures	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
15th	3	Exam	Exam		

11. Course Evaluation

Midpoints are 40 come from:

15 points theory exam + 5 points for quizzes, and presentations.

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. Inorganic Medicinal and Pharmaceutical Chemistry by Block, Roche Soine, and Wilson, latest edition 2. Wilson and Gisvold; Textbook of Organic Medicinal and Pharmaceutical Chemistry; Delgado JN, Remers WA, (eds); latest edition
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Organic Pharmaceutical Chemistry I
2. Course Code:
326
3. Semester / Year:
Semester 2/ 3rd third
4. Description Preparation Date:
20/4/2025
5. Available Attendance Forms:
Full-time (in attendance)
6. Number of Credit Hours (Total) / Number of Units (Total)
3h. Theory+2 h. practical/ 4
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 le and the role of medicinal chemistry in the discovery and development synthetic 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 resources - 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 resources - 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 resources - 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 resources - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
15th		Exam	Exam		

11. Course Evaluation

Midpoints are 40 come from:

15 points theory exam + 5 points for quizzes, and presentations.

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)	3. 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 (II)

2. Course Code:

412

3. Semester / Year:

Semester 1/ 4th fourth

4. Description Preparation Date:

20/4/2025

5. Available Attendance Forms:

Full-time (in attendance)

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

3h. Theory+2 h. practical/ 4

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 enables 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	Analgesic System	Analgesic agents (SAR of morphine, SAR of meperic type molecules; SAR of methadone type compoun N- methylbezomorphans.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
6th	3	Analgesic System	Antagonist-type analgesic benzomorphans; Analgesi receptors, Endogenous opioids.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
7th	3	Analgesic System	Products; Antitussive age Anti-inflammatory analgesics.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
8th	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
9th	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
10th	3	Adrenergic System CNS depressant	Adrenergic receptor antagonists. CNS depressant	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
11th	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

12th	3	CNS depressant	CNS depressant with skeletal muscle relaxant properties; Antipsychotics; Anticonvulsants.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
13th	3	CNS Stimulants	CNS Stimulants	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
14th	3	Hormones	Steroidal & nonsteroidal hormones	- 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:

15 points theory exam + 5 points for quizzes, and presentations.

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)	4. 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:
Semester 2/ 4th fourth
4. Description Preparation Date:
20/4/2025
5. Available Attendance Forms:
Full-time (in attendance)
6. Number of Credit Hours (Total) / Number of Units (Total)
3h. Theory+2 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	4. To the discovery and development of new agents for treating diseases enables the translating of the drug structural formula into therapeutic effect. 5. It focuses on the methods of preparation for some pharmaceutical agents.
9. Teaching and Learning Strategies	
Strategy	7. Active participation by engaging actively in lectures and discussions. 8. Effective time management by creating a study schedule. 9. Utilize resources. 10. Collaborative learning from study groups. 11. Hands-on experience by taking advantage of laboratory sessions. 12. 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	Antibiotics	β-Lactam antibiotics (Penicillins).	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz

2nd	3	Antibiotics	β-Lactamase inhibitors.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
3rd	3	Antibiotics	Cephalosporins and Monobactams.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
4th	3	Antibiotics	Aminoglycosides and Chloramphenicol; Tetracyclines.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
5th	3	Antibiotics	Macrolides; Lincomycins a Polypeptides.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
6th	3	Antibiotics	Antiviral agents (properti of viruses, viral classificat products).	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
7th	3	Antibiotics	Sulfonamides (chemistry, nomenclature, mechanism action, resistance, toxicity side effects, metabolism, protein binding, distributi and SAR); products; Sulfo	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
8th	3	Anticancer	Anti-neoplastic agents; Alkylating agents.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
9th	3	Anticancer	Antimetabolites.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
10th	3	Anticancer	Antibiotics.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz
11th	3	Anticancer	Plant products.	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid + final) Exams with Quizz

12th	3	Anticancer	Miscellaneous compounds	- Active Reading Textbooks. - Online resource - Self-assessment - Reflection.	Formative and Summative Evaluation (Mid = final) Exams with Quizz
13th	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
14th	3	Hormones and Monoclonal 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
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)	5. 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:
Semester 1/ 5th
4. Description Preparation Date:
20-4-2025
5. Available Attendance Forms:
Full-time (in attendance)
6. Number of Credit Hours (Total) / Number of Units (Total)
2h. Theory / 2
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	To give the students' knowledge and experience in pro-drug and hormones as part of their medicinal and pharmaceutical field. 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:

15 points theory exam + 5 points for quizzes, and presentations.

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)	6. 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:
Semester 2/ 5th
4. Description Preparation Date:
20-4-2025
5. Available Attendance Forms:
Full-time (in attendance)
6. Number of Credit Hours (Total) / Number of Units (Total)
3h. Theory+2 h. practical/ 4 h
7. Course administrator's name (mention all, if more than one name)
Name: Rusul Yahya Jasim Alabada Email: Dr.Rusul.Alabada@mu.edu.iq
8. Course Objectives

Course Objectives	Studying spectrometric methods used for the identification and characterization of organic compounds, including UV, IR, MASS, and NMR spectroscopy. 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:

3. 15 points theory exam + 5 points for quizzes, and presentations.
4. 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)	7. Spectrometric Identification of Organic Compounds by Silverstein, Bassler, and Morrill 8. Applications of absorption spectroscopy of organic compounds by Dyer JR. 9. Organic Chemistry by McMurry; 5thed; Thomason learning CA, USA 2000.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Human Biology

1. Course Name:
Human Biology
2. Course Code:
111
3. Semester / Year:
The First / The first year
4. Description Preparation Date:
2025\4\26
5. Available Attendance Forms:
Attendance in lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours per week (2 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	Study the human body composition, types of cell structures, types of tissues, bone, skeleton, joints and muscle as well as the nutrition. Human biology also explains in details the different body systems and human genetics. At the end of the course the student should be able to describe the human body composition, body systems structure and function, and human genetics such as the mendelain inheritance, division of chromosomes, and terms such as allel, locus homo and heterozygous.

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	Biology	Introduction to human biology	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	2	Cell	Cell structure and the study of the structure and function of cell organelles	=	=
3.	2	Tissues, bone and	Study of the	=	=

		cartilages	structure and function of the skeleton		
4.	2	Nervous system (central & peripheral)	Study of the structure and function of the nervous system	=	=
5.	2	Nutrition	Studying the most important types of foods that humans need	=	=
6.	2	Digestive system (Mouth, Esophagus, Stomach)	Study of the structure and function of the digestive system	=	=
7.	2	Digestive system (intestine)	Study of the structure and function of the digestive system	=	=
8.	2	Excretory system & respiration	Study of the excretory system and respiratory function	=	=
9.	2	Human genetics (chromosomes & semi- lethal genes)	Study of chromosomes and genes	=	=
10.	2	Skin	Study of chromosomes and genes	=	=
11.	2	Circulatory system	Blood; bone marrow; white blood cells; immunity;	=	=
12.	2	Lymphocyte system	Platelets; red blood cells; anemia; polycythemia	=	=
13.	2	Immunity system	Study of the immune system and inflammation	=	=
14.	2	Immunity (inflammation, immunity, blood)	Study of the immune system and inflammation	=	=
15.	2	Immune diseases	Study of the immune 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% 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)	Tylar Human Biology (2006)
Recommended books and references (scientific journals, reports...)	Human Biology (2006)
Electronic References, Websites	https://scholar.google.com/

1. Course Name:
Mathematics and Biostatistics
2. Course Code:
115
3. Semester / Year:
The First / The first year
4. Description Preparation Date:
2025\4\26
5. Available Attendance Forms:
Attendance in lecture
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.Ammar Alhasan Email: ammar.physicist@mu.edu.iq
8. Course Objectives

Course Objectives	• To enable students to understand the basic principles of calculus and mathematics • To enable students to understand the basic principles of life statistics • Linking the concepts of mathematics and life statistics to the student's field of specialization

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	General conce coordinate and map at level;	General conceptscoordinate and graph in plane; inequality; absolute value or magnitude	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	3	The concept of a funct and its graph	function and their graphs; displacement function; slope and equation for lines	=	=
3.	3	The purpose of function	Limits and continuity: Limits; theorem of limits; limit involving infinity;	=	=
4.	3	Continuity of function	continuity; continuity	=	=

			conditions		
5.	3	The concept of derivative and its rules	Derivatives: Line tangent and derivatives; differentiation rules	=	=
6.	3	The derivative of homotopic function	derivative of trigonometric function; practice exercises	=	=
7.	3	The concept integration	Integration: Indefinite integrals; rules for indefinite integrals; integration formulas for basic trigonometric function.	=	=
8.	3	Properties of definite integral	integrals; properties of definite integrals; practice exercises	=	=
9.	3	Introduction to statistics	Biostatistics: General concepts of statistics; statistical methods; statistical theory; applied statistics; statistical operations	=	=
10.	3	The concept of probability and its properties	Probability concepts: Properties of probability; Set theory and set notation (basic notation); counting techniques- permutations and combinations; calculating the probability of an events; .	=	=
11.	3	The concept of variables, properties and distribution	probability distribution of discrete variable; binomial distribution, Poisson distribution;	=	=
12.	3	Continuous and normal probability distribution	continues probability distribution and normal distribution, review questions and exercises	=	=
13.	3	The concept of central tendency	The concept of central tendency: Mean of sample and mean of	=	=

			population; median; mode		
14.	3	Measure centrality	measure of central tendency; review questions and exercises	=	=
15.	3	Deviations and differences	Deviations and variation: Deviation; dispersion and variability; standard deviation and variance; coefficient of variations; standard error	=	=

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)	Thomas GB (Eds.)
Main references (sources)	• Finny RI • Thomas GB (Eds.)
Recommended books and references (scientific journals, reports...)	Calculus and Analytical Geometry
Electronic References, Websites	https://scholar.google.com/

Course Description Form

1. Course Name:
Human rights and democracy
2. Course Code:
3. Semester / Year:
The First / The first year
4. Description Preparation Date:
1/5/2025
5. Available Attendance Forms:
Attendance in lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 2 units
7. Course administrator's name (mention all, if more than one name)
Asst. lec. Adyan Mzher Mohamed Email: : adyan1996m@gmail.com
8. Course Objectives

Course Objectives	**Highlighting the rights that the individual can acquire from the state, and what permeates** **• This is one of the obligations on it** **• Highlighting the concept of democracy, and consequent application of its representation** **• By a group of members at all levels**

9. Teaching and Learning Strategies	
Strategy	cooperative education strategy Education strategy Education strategy is one accurate paper Education strategy in real time Education Strategy Series notes

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	An idea of rights	The concept t of	The	• Final Al -

		Human	human rights	blackboard, the video, Port Point Laws, Pictur	Amjan, Term Exam, Daily and Oral Examination
2	2	Humanrights statement in ancient civilizations	Human rights ancient civilizations	=	=
3	2	Humanrights statementi the Holy Quran	Humanrights statemen in the Holy Quran	=	=
4	2	Middle Ages HumanRights Statement	Middle Ages HumanRights Statement	=	=
5	2	Human Rights Statement In modern thought	Statement of the role of organizations Non – governmental Field human rights	=	=
6	2	Human Rights Statement In the modern era At the level revolution and laws	Human rights in the era Talking at the level Revolution and laws	=	=
7	2	The statement contemporary recognition human rights	suThe statement contemporary recognition human rights	=	=
8	Exam				
9	2	Statement of the international recognition of human rights yet World War II	International recognition of rights Man after Wk orld War II	=	=
10	2	The role of NGOs in the field of	Statement of the role of organizations	=	=

		human rights	Non – governmental Field human rights		
11	2	Statement of the role of organizations Non -governmental Field human rights	Statement of the role of organizations Non – governmental Field human rights	=	=
12	2	Historical introduction to The idea of democracy	Dul Historical introduction to The idea of democracy	=	=
13	2	Concept statement Democracy	The concept democracy	=	=
14	2	Types of democracy	Types of democracy	=	=
15	2	Democratic differenceand human rights	Democracand human rights	=	=

11. Course Evaluation

Grade distribution: (35) marks for the midterm exam (5) marks including daily participation, assignments, and attendance (60) marks for the final exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Human Rights Writer, d. Hamid Hanoun Khaled
Main references (sources)	Democracy and human rights, d. Abdul Majeed Al -Hakim
Recommended books and references (scientific journals, reports…)	nothing
Electronic References, Websites	There is a set of research that deals with democracy And human rights

1. Course Name:

Human Anatomy

2. Course Code:

127

3. Semester / Year:

The second / The first year

4. Description Preparation Date:

2025\4\29

5. Available Attendance Forms:

Attendance in lecture

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

(1 theoretical hours and 2 practical hours) / 2 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	• To enable students study the anatomical position of different organs and tissues in all systems of the human body. • Help students to evaluate anatomical adaptations correlate with the normal body functions. • To become familiar with human body cavities, organs orientation, and body movement terminology.

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	Circulatory System	Location of Vascular system(Heart, Arteries, Veins)	Whiteboard, videos, pictures, diagrams, PowerPoint presentations & Laboratory 3D Anatomical Models	Final exam, mid-term exam, and daily Quizzes
2.	3	Circulatory System	Lymphatic Circulation	=	=

3.	3	Lymphoid System	Thymus gland, Spleen and Lymph	=	=
4.	3	Lymphoid System	Lymphoid Nodule (MALT) & Tonsils	=	=
5.	3	Nervous System	Central and Peripheral N.S. by Location	=	=
6.	3	Respiratory System	Conducting portion (Nose, Nasopharynx, Trachea, Bronchus & Bronchioles)	=	=
7.	3	Digestive System	Location of different parts of digestive tract (GIT) (Oral cavity, Mouth, Esophagus & Stomach	=	=
8.	3	Digestive System	Small intestines, Large intestines, Rectum & Anus	=	=
9.	3	Digestive System	Glands associated with Digestive Tract by location(Salivary glands, pancreas, Liver & Gall bladder)	=	=
10.	3	Endocrine System	Location of Pituitary gland, Adrenal, Thyroid, Parathyroid gland	=	=
11.	3	Endocrine System	Islets of Langerhans, Pineal Glands	=	=
12.	3	Endocrine System	Male Reproductive System: Location of Testes, Excretory Genital Ducts, & Glands (Seminal vesicles)	=	=
13.	3	Endocrine System	Prostates & Cowper's Glands	=	=
14.	3	Endocrine System	Female Reproductive System (Location of Ovary, Ovary ducts, Uterus & Vagina)	=	=
15.	3	Urinary System	Location of Kidney & Nephron, Ureter,	=	=

			Bladder & Urethra)		

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, Quizzes, laboratory exams, and classroom activities) 60% final exam score	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Clinical Anatomy by Regions (Richard S. Snell 8th ed. 2010)
Main references (sources)	Essentials of anatomy and Physiology (Valerie Scanlon, Tina Sanders 5th ed. 2007)
Recommended books and references (scientific journals, reports...)	ANATOMY and PHYSIOLOGY in Health and ess (Ross and Wilson 11th ed. 2010)
Electronic References, Websites	https://scholar.google.com/

1. Course Name:
Medical Physics
2. Course Code:
3. Semester / Year:
The second / The first year
4. Description Preparation Date:
2025\4\24
5. Available Attendance Forms:
Attendance in lecture
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.Ammar 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 Form

1. Course Name:

Histology

2. Course Code:

127 1-

3. Semester / Year:

First semester / The first year

4. Description Preparation Date:

26 – 4 – 2025

5. Available Attendance Forms:

Attendance in lecture

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: Ahmed Adeeb Mohamed
Email: ahmedadeeb57@mu.edu.iq

8. Course Objectives

Course Objectives	***Histology is one of the most useful courses that the first class student in college of pharmacy will take in the department of clinical laboratory sciences. It brings together a lot of the information the student have already acquired about cells and organs, and it points him in the fascinating direction of development and differentiation. In fact, histology is the core subject in the study of microscopic anatomy, and cell and together with ultrastructural study of subcellular histology. What is more, contemporary medical researcher is utterly dependent on histology.***

9. Teaching and Learning Strategies

Strategy	***It brings together a lot of the information the student have already acquired about cells and organs, and it points him in the fascinating direction of development and differentiation.***

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Structure of the vascular system (Heart wall, Arteries, Veins Capillaries)	**Circulatory system**	White board, video, pictures, diagrams, PowerPoint lectur	Final exam, mid-t exam, daily and exams
2	2	Structure of the lymphatic	**Circulatory system**		

		system (Lymphaticcapillary).	+ **Lymphatic tissue**		
3	2	**Lymphoid tissue: struct and function of the (thyr gland, spleen and lyr nodes, lymph nodule tonsile)** and central nerv system	Lymphatic system + b cerebellum and cerebrum spinal cord		
4	2	Peripheral nervous system	Ganglia and nerves		
5	2	Nasal and nasopharynx trachea and bronchi bronchiole	Respiratory system conducting portion)		
6	2	Lung + oral cavity esophagus and stomach	Respiratory sys (respiration portion) digestive system1		
7	2	Small and large intestine accessory digestive glands	Digestive system 2		
8	2	pituitary gland	Endocrine system:		
9	2	adrenal gland, thyroid gla parathyroid and pineal glan	Endocrine system		
10	2	testes and stages spermatogenesis	Male reproductive system		
11	2	genital ducts and glands ovary, oviduct, uterus	Male and female reproduc system		
12	2	vagina and stages of folli development- ovalution	Female reproductive syster		
13	2	kidney, nephron,	Urinary system		
14	2	ureter, bladder and urethra	Urinary system		
15	2	thick and thin skin	The skin		

11. Course Evaluation

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

text Basic Histology. 11th ed. (2005)	
text Basic Histology. 11th ed. (2005)	
text Basic Histology. 11th ed. (2005)	
https://scholar.google.com	

1. Course Name:
computerI
2. Course Code:
312
3. Semester / Year:
The first / The first year
4. Description Preparation Date:
2025/4/29
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (1 theoretical hours and 2 practical hours)
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Lecturer Faris Mutar Mahdi | Email: faris.mutar@mu.edu.iq

8. Course Objectives

Course Objectives	• Introduce students to the basic components of computers and their applications in the pharmaceutical field. • Enable students to use Microsoft Office programs (e.g., Word, Excel) to format reports and analyze basic pharmaceutical data. • Teach students how to conduct academic research online using reliable medical and pharmaceutical databases. • Raise awareness about cybersecurity and protecting personal and professional data in the pharmaceutical field. • Provide students with basic skills in presenting information using presentation tools (e.g., PowerPoint).

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	components, types, and classifications	Computer components, types of computers, classifications	Whiteboard, video, images, diagrams, PowerPoint lecture	Final exam, daily exams, oral exams, project
2.	2	Understanding computer components, types, and classifications	Computer components, types of computers, classifications	Whiteboard, video, images, diagrams, PowerPoint lecture	Final exam, daily exams, oral exams, project
3.	2	Understanding hardware, software, and number	Hardware and software components, number	Whiteboard, video, images,	Final exam, daily exams, oral exams, project

		systems	systems	diagrams, PowerPoint lecture	
4.	2	Understanding computer security and digital ethics	Computer security, software licensing, introduction to digital ethics	Whiteboard, video, images, diagrams, PowerPoint lecture	Final exam, daily exams, oral exams, project
5.	2	Understanding digital violations and licensing	Digital violations, computer privacy, software licensing types	Whiteboard, video, images, diagrams, PowerPoint lecture	Final exam, daily exams, oral exams, project
6.	2	Understanding hacking and intellectual property	Intellectual property, electronic hacking, sources of hacking	Whiteboard, video, images, diagrams, PowerPoint lecture	Final exam, daily exams, oral exams, project
7.	2	Distinguishing malware and viruses	Malware, viruses, their effects, virus diagnostics	Whiteboard, video, images, diagrams, PowerPoint lecture	Final exam, daily exams, oral exams, project
8.	2	Acquiring virus protection skills	Virus prevention steps and damage mitigation	Whiteboard, video, images, diagrams, PowerPoint lecture	Final exam, daily exams, oral exams, project
9.	2	Understanding operating systems	Introduction and explanation of operating systems	Whiteboard, video, images, diagrams, PowerPoint lecture	Final exam, daily exams, oral exams, project
10.	2	Understanding functions and types of operating systems	Functions and goals of operating systems, classifications with examples	Whiteboard, video, images, diagrams, PowerPoint lecture	Final exam, daily exams, oral exams, project
11.	2	Knowing operating system installation requirements	Requirements for installing operating systems	Whiteboard, video, images, diagrams, PowerPoint lecture	Final exam, daily exams, oral exams, project
12.	2	Mastering desktop interface usage	Desktop components, taskbar, control panel	Whiteboard, video, images, diagrams, PowerPoint lecture	Final exam, daily exams, oral exams, project
13.	2	Using computer applications in e-learning	Important computer applications in e-learning	Whiteboard, video, images, diagrams, PowerPoint lecture	Final exam, daily exams, oral exams, project
14.	2	Distinguishing malware and viruses	Malware, viruses, their effects, virus diagnostics	Whiteboard, video, images, diagrams, PowerPoint lecture	Final exam, daily exams, oral exams, project
15.	2	Final examinations	Final examinations	Final examinations	Final examinations
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)	Computer in Finance and Business – Dr. Osama Azmi Salam
Main references (sources)	Laudon, K.C., & Laudon, J.P. (2018). Managem Information Systems: Managing the Digital Firm. Pearson
Recommended books and references (scientific journals, reports...)	Shelly, G.B., & Vermaat, M.E. (2010). Discover Computers: Fundamentals. Cengage Learning
Electronic References, Websites	: https://www.w3schools.com https://scholar.google.com

Course Description Form

1. Course Name:
Medical Microbiologyl
2. Course Code:
212
3. Semester / Year:
Semester1/ The second year
4. Description Preparation Date:
1/5/2025
5. Available Attendance Forms:
Attendance in lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
3h. Theory+2 h. practical/ 4 unit
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

1. Course Name:
Baath system crimes
2. Course Code:
3. Semester / Year:
The first / The second year
4. Description Preparation Date:
2/5/2025
5. Available Attendance Forms:
Attendance in lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 1 units
7. Course administrator's name (mention all, if more than one name)
Name: Asst. lec. Adyan Mzher Mohamed Email: : adyan1996m@gmail.com

8. Course Objectives	
Course Objectives	**• Highlighting the most important resurrection crimes in Iraq, from Psychological crimes, social crimes and environmental crimes. • Educating students on the effects of the crimes of the system Resurrection.....**

9. Teaching and Learning Strategies	
Strategy	Cooperative learning strategy Learning strategy brainstorming Learning strategy is one accurate paper Learning strategy in real time Learning strategy notes chain

10. Course Structure

Week	Hours	Required Learning	Unit or subject	Learning	Evaluation

		Outcomes	name	method	method
1	2	Statement of the most important crimes committed by the Baath regin	Introduction to system crimes Resurrection	The blackboard, the video, Port Point Laws, Pictur	Final exam,Term Exam,Daily andOral Examination
2	2	Definition of crimes	The concept crimes	=	=
3	2	Explanation of the sections crimes	Crime sections	=	=
4	2	Explain the types crimes International	Types international crimes	=	=
5	2	Statement statement issued the Supreme Criminal Court	Decisions issued the Supreme Criminal Court	=	=
6	2	Psychological crime statement	Psychological crime statement	=	=
7	2	Statement of social crimes	Social crimes	=	=
8		Exam Extend			
9	2	A statement of violation of laws Iraqi	A statement of violation of laws Iraqi	=	=
10	2	Pictures of violatic of rights Human and power crimes	Pictures of violatic eum of rights Human and power crimes	=	=
11	2	Explain the decisions of violations Political and military	Violations decisior Political and military For the Baath system	=	=
12	2	Military pollution statement And radiation and an explosion	Military pollution statement And radiation and explosion	=	=

		Mine	Mine		
13	2	Statement of the destruction of cities and villages (Earth policy Burned)	Statement of the destruction of cities and villages (Earth policy Burned)	=	=
14	2	Justice bulldozing statement And the marshes and trees	Grading orchards And the marshes and trees	=	=
15	2	Explanation of the events of the genocide The collective committed from The Baathist regime in Iraq	The events of the graves of extermination The collective committed from The Baathist regime in Iraq	=	=

11. Course Evaluation

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 Book of the Crime of the Baath System
Main references (sources)	Ayman Abdel Aziz Salama, the state's responsibility for committing genocide
Recommended books and references (scientific journals, reports…)	Dr.. Ali Hanoush, the problems of the present and the future options, a study in environmental pollution.
Electronic References, Websites	There are many electronic sources on a network The Internet, on the subject of crimes in general And Baath crimes in particular

Course Description Form

1. Course Name:
Medical Microbiologyll (Medical Virology, immunology, and Parasitology)
2. Course Code:
222
3. Semester / Year:
Semester2/ The second year
4. Description Preparation Date:
1/5/2025
5. Available Attendance Forms:
Attendance in lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
3h. Theory+2 h. practical/4 unit
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 paras organisms. 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 with Qiuzes.
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 with Qiuzes.
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 with Qiuzes.
12th	3	Evaluate the role immunology in vari disease proces including autoimm 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: 15 points theory exam+ 5 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	Medical Microbiology by Murry, Rosenthal, and Pfaller. Journal of parasitology

(scientific journals, reports…)	Journal of Virology, and Journal of Immunology.
Electronic References, Websites	

1. Course Name:
Computer II
2. Course Code:
3. Semester / Year:
The second / 2024-2025
4. Description Preparation Date:
2025\5\16
5. Available Attendance Forms:
In presence
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours per week (1 theoretical hours and 2 practical hours) / 2 units
7. Course administrator's name (mention all, if more than one name)
Name: Ali Khalil Abdul Kazem

8. Course Objectives

Course Objectives	•To enable students to understand the basic principles of computer science •Developing the student's skills in using computer programs such as Office programs

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	Developing student skills	Learn Microsoft Word 2010	Blackboard, video, pictures, charts, PowerPoint lecture and application directly on the computer	Final exam, mid-term exam, daily and oral exams
2.	2	Developing student skills	introduction	=	=
3.	2	Developing student skills	The main facade	=	=
4.	2	Developing student skills	Word Art Main text	=	=
5.	2	Developing student skills	General settings	=	=
6.	2	Developing student skills	TextsText	=	=

7.	2	Developing student skills	Basic keyboard shortcuts	=	=
8.	2	Developing student skills	Graphics + Tables	=	=
9.	2	Developing student skills	Microsoft PowerPoint 2010	=	=
10.	2	Developing student skills	introduction	=	=
11.	2	Developing student skills	User Interface	=	=
12.	2	Developing student skills	Slide1T 1Set up a slide	=	=
13.	2	Developing student skills	1T Custom Animation1T Animate elements on the slide	=	=
14.	2	Developing student skills	1File storage formats	=	=
15.	2	Developing student skills	1Set up a multi-slide project	=	=

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)	مبادئ علم الحاسوب
Main references (sources)	مبادئ علم الحاسوب
Recommended books and references (scientific journals, reports...)	مبادئ علم الحاسوب
Electronic References, Websites	https://scholar.google.com/

1. Course Name:
Biochemistry I
2. Course Code:
314
3. Semester / Year:
The first / Third year
4. Description Preparation Date:
1/5/2025
5. Available Attendance Forms:
Attendance in lecture
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 useful for students who want to study Biochemistry.** **The course uses simple protocols and available materials and instrume to understand Biochemical substances.** **–Some experiments were put to teach students how to work independer in the any Lab.** **– Modern lab researchers should know the principles of the biochem methods of analysis and to learn the main theoretical statements. For medical Lab Science students have to get the minimum of manual skills dur a research 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	Unit or subject name	Learning	Evaluation

		Outcomes		method	method
1.	3	**Introduction to the macromolecules biochemistry**	**Introduction to the macromolecules biochemistry: Definitions and terms; proteins, enzymes, DNA; Clinical value.** .	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	3	**Amino acids chemistry**	**Amino acids: Structures of A (table of standard A.A abbreviation and side chain); Classification, properties, isomerism. Amino acids: Chemical reactions, Zwitter ions, titrati curve calculating isoelectric point values. Examples and questions. Non standards A.A Structures, existence and clinical value.** .	=	=
3.	3	**Protein and Peptid chemistry**	**Peptides: Peptide bond, resonance forms, isomers, physical properties and chemical reactions. Essential poly peptides in human body, structures, roles and clinical values. Proteins: Structure and conformations of proteins, Primary structure, Secondary structure (α helix, β sheet), tertiary structure, quaternary structure. Classification, synthesis, cellular functions (Enzymes, cell signaling, and ligand transport, structural proteins), protein in nutrition.**	=	=
4.	3	**Protein chemistry**	Denaturation of proteins and protein sequencing: Determining A.A composition, N- terminal A.A analysis, C- terminal A.A analysis, Edman degradation, prediction protein sequence from DNA/	=	=

			RNA sequences. Methods of protein study: Protein purification, cellular localization, proteomics and bioinformatics, structure predication and simulation.		
5.	3	**Carbohydrates Chemistry**	Carbohydrates: Chemistry and classification, biomedical importance, classification of CHO, Stereochemistry of monosaccharides, metabolism of CHO; Physiologically important monosaccharides, glycosides, disaccharides, polysaccharides.	=	=
6.	3	Lipids chemistry	Lipids: Introduction, classification of lipids, fatty acids (F.A), nomenclature of F.A, saturated F.A, unsaturated F.A, physical and physiological properties of F.A, metabolism of lipids. Phospholipids, lipid peroxidation and antioxidants, separation and identification of lipids, amphipathic lipids.	=	=
7.	3	Enzymes chemistry	Enzymes: Structures and mechanism, nomenclature, classification, mechanisms of catalysis, thermodynamics, specificity, lock and key model, induced fit model, transition state stabilization, dynamics and function, allosteric modulation. Biological function, cofactors, coenzymes, involvement in disease.	=	=
8.	3	Kinetic enzymes	Kinetics: General principles, factors effecting enzyme rates (substrate conc., pH, temperature, etc), single-substrate reaction (Michaelis-Menten kinetics), kinetic	=	=

			constants. Examples of kinetic questions and solutions. Enzyme inhibition: Reversible inhibitors, competitive and non competitive inhibition, mixed-type inhibition, Irreversible inhibition. Inhibition kinetics and binding affinities (ki), questions and solutions		
9.	3	Kinetic enzymes	Control of activity and uses of in activators; multi-substrate reactions, ternary-complex mechanisms, ping-pong mechanisms, non-Michaelis-Menten kinetics, pre-steady-state kinetics, chemical mechanisms.	=	=
10.	3	Nucleic Acid chemistry	Nucleic Acid: Chemical structure, nucleic acid components, nucleic acid bases, nucleotides and deoxynucleotides (Properties, base pairing, sense and antisense, super-coiling, alternative structures, quadruple structures.	=	=
11.	3	DNA and RNA chemistry	Biological functions of DNA: Genes and genomes, transcription and translation, replication.	=	=
12.	3	Biochemistry of extracellular and intracellular communication	Biochemistry of extracellular and intracellular communication: Plasma membrane structure and function; Biomedical importance, membrane proteins associated with lipid bilayer, membranes protein composition, dynamic structures of membranes, a symmetric structures of membranes.	=	=
13.	3	. Biochemistry of extracellular	Artificial membranes model, the fluid mosaic	=	=

		and intracellular communication	model, membrane selectivity, physiological functions of plasma membranes. .		
14.	3	Biochemistry of the endocrine system	Biochemistry of the endocrine system: Classification of hormones, biomedical importance, the target cell concept and hormone receptors, biochemistry of hormone signal transduction.	=	=
15.	3	Nutrition, digestion, and absorption. Biomedical importance, digestion and absorption of macromolecules	Special topics: Nutrition, digestion, and absorption. Biomedical importance, digestion and absorption of carbohydrates, lipids, proteins, vitamins and minerals; energy balance. Biochemistry of hemostasis and clot formation.	=	=

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:

Pathophysiology

2. Course Code:

315

3. Semester / Year:

The first / The third year

4. Description Preparation Date:

2025\4\26

5. Available Attendance Forms:

Attendance in lecture

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	Atrophy; Hypertrophy;	=	=

		tissue response	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 II

2. Course Code:

329

3. Semester / Year:

The second / The third year

4. Description Preparation Date:

29/4/2025

5. Available Attendance Forms:

Attendance in lecture

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.	3	Introduction To Metabolism	Bioenergetics. Biologic oxidation.	Blackboard, video, pictures, diagrams, PowerPoint lecture	Final exam, mid-term exam, daily and oral exams
2.	3	Carbohydrate metabolism	The respiratory chain and oxidative phosphorylation.	=	=
3.	3	Carbohydrate metabolism	Citric Acid Cycle	=	=
4.	3	Carbohydrate metabolism	Glycolysis:	=	=

5.	3	Carbohydrate metabolism	Metabolism of glycogen	=	=
6.	3	Carbohydrate metabolism	Gluconeogenesis.	=	=
7.	3	Carbohydrate metabolism	Pentose phosphate pathway and other pathways of hexose metabolism.	=	=
8.	3	Lipid metabolism	Biosynthesis of fatty acids.	=	=
9.	3	Lipid metabolism	Oxidation of fatty acid	=	=
10.	3	Lipid metabolism	Lipid transport and storage. Cholesterol synthesis، transport, and excretion	=	=
11.	3	Amino acid and protein metabolism	Biosynthesis of the Nutritionally Nonessential Amino Acids	=	=
12.	3	Amino acid and protein metabolism	Catabolism of Proteins & of Amino Acid Nitrogen	=	=
13.	3	. Amino acid and protein metabolism	Conversion of Amino Acids to Specialized Products.	=	=
14.	3	. macromolecule	Nucleotides ,purine and pyrimidine metabolism	=	=
15.	3		Porphyrins & Bile Pigments	=	=

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:

Clinical chemistry

2. Course Code:

515

3. Semester / Year:

The first / The fifth year

4. Description Preparation Date:

29/4/2025

5. Available Attendance Forms:

Attendance in lecture

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.	3	**Disorders of**	**Function of Extracellular Glucose**	Blackb	Final

		Carbohydrates metabolism, Hyperglycemia & Diabetes mellitu Hypoglycemia.	**Control Of Plasma Glucose Concentration** **Pathological Lactic Acidosis** **Hyperglycemia And Diabetes Mellitus** **Diabetes Mellitus Classification** **Insulin Resistance Syndrome Or Metabolic Syndrome** **Metabolic Features Of Diabetes Mellitus** **Hyperglycemia** **Abnormalities In Lipid Metabolism** **Monitoring Of Diabetes Mellitus** **Acute Metabolic Complications Of Diabetes Mellitus** **Principles Of Treatment Of Diabetic Coma** **Hypoglycaemia** **Hyperinsulinaemic Hypoglycaemia** **Reactive (Functional) Hypoglycaemia** **Ketonuria**	oard, video, pictures, diagrams, Power Point lecture	exam, mid-term exam, daily and oral exams
2.	3	**Disorders of lipid metabolism..**	**Introduction:** **lipoproteins** **DISORDERS OF LIPID METABOLISM** **Chylomicron syndrome** **Familial hypercholesterolaemia** **Familial defective apoB3500** **Familial combined hyperlipidaemia** **Familial hypertriglyceridemia** **Polygenic hypercholesterolaemia** **Hyperalphalipoproteinaemia** **Secondary hyperlipidaemias**		
3.	3	**Liver Function Tests**	**Introduction:** **The liver** **Functions of Liver** **Liver Functions Test overview** **Bilirubin** **Jaundice** **Physiological Jaundice** **Alkaline phosphatase (ALP)** **γ-glutamyl transferase (GGT)** **5-Nucleotidase (5'NT)** **Aminotransferases** **Plasma Albumin** **Prothrombin time** **Acute Hepatitis** **Chronic Hepatitis** **Liver Cirrhosis**		
4.	3	**Kidney Function Tests.**	**Anatomy of the Nephron** **Physiological functions of kidneys** **Urine formation**		

			Renal Function Tests **Glomerular** **Tubular** **Acute Renal Failure** **Chronic Kidney Disease**		
5.	3	**Plasma Proteins and Clinical Enzymology**	**Types of plasma proteins** **Measurement of plasma proteins** **Albumin** **Globulins** **A/G ratio** **Plasma enzymes** **Isoenzymes** **Enzymes of clinical interest** **Diagnosis of Myocardial Infarction**	=	
6.	3	Hypothalamus & pituitary endocrinology,	**Physiology of Endocrine System** **General functions of hormone** **Classification of hormone** **Mechanism of hormonal action** **Regulation of hormonal secretion** **Disorders of the endocrine system Overview** **Assessment of endocrine functions**	=	
7.	3	disorders of anterior pituitary hormones,	**Pituitary Gland Disorders** **Thyroid Gland Disorders** **Thyroid gland secretes:** **Plasma T_3 & T_4** **Hypothalamic pituitary thyroid axis: (regulation of the T3,T4 release)** **Thyroid functions** **Thyroid function tests** **Thyroid dysfunctions** **Lab. Diagnosis (Hypothyroidism) :** **Hyperthyroidism:** **Clinical features:** **Lab. Diagnosis:**	=	
8.	3	disorders of adrenal gland, hypopituitrism	**Adrenal Gland Disorders** **Thyroid gland secretes:** **Plasma T_3 & T_4** **Hypothalamic pituitary thyroid axis: (regulation of the T3,T4 release)** **Thyroid functions** **Thyroid function tests** **Thyroid dysfunctions** **Lab. Diagnosis (Hypothyroidism) :** **Hyperthyroidism:** **Clinical features:** **Lab. Diagnosis:**	=	

9.	3	Reproductive system, disorders of gonadal function in males	**Male sex hormone** **Plasma androgens:** **The hypothalamic-pituitary-testicular axis** **Androgens Functions** **Disorders of male gonadal function** **Disorders of male gonadal function** **Gynecomastia:** **Erectile dysfunction (ED):**	=	
10	3	Reproductive system, disorders of gonadal function in females,	**Female sex hormone** **Oestrogens Functions** **The hypothalamic-pituitarygonadal axis** **Disorders of female gonadal function** **Hypogonadism** **Hirsutism** **Virilism:** **History and examination**	=	
11	3	Tumor markers.	**Characteristics of cancer** **Tumor Markers** **Characteristics ofa Tumor Maker** **Clinical Applications of Tumor Markers** **Examples of some clinically important tumor markers** ○ **AFP(alpha feto protein)**: ○ **CEA (carcinoembryonic antigen)** 1. **CA 125 (cancer antigen 125)** 2. **CA 15-3 (Cancer antigen 15-3)** 3. **PSA (prostatic specific antigen)** 4. **LDH (Lactate dehydrogenase)** 5. **Prostatic acid phosphatase (PAP)** 6. **Calcitonin**	=	
12	3	Drug interaction with laboratory Tests.	○ CLASSIFICATION ✓ Screening Test ✓ Diagnostic Test MONITORING DRUG THERAPY ➢ Laboratory Test Results ○ NORMAL VALUES ○ NORMAL LAB TEST RESULT ○ ABNORMAL LAB TEST RESULT The quality of Quantitative assay is measured in terms of accuracy. DRUG LABORATORY TEST INTERACTION 1. SERUM BILIRUBIN ○ Drug Influence: ○ Interfering Factors 2. GLUCOSE LEVEL Factors Affecting Laboratory Results Drug Influence 3. CREATININE	=	

			4. Blood Urea Nitrogen (BUN) Drug that increase BUN level		
13	3	Disorders of calcium metabolism	**Functions of serum calcium** **Calcium homeostasis** **Parathyroid hormone (PTH)** **Vitamin D** **Calcitonin** **Serum calcium** **Hypocalcaemia** **Hypercalcaemia** **Serum phosphate** **Bone metabolism markers**		
14	3	Acid- Base Disorders.	▪ **Production of H^+ ions** ▪ **Mechanism for H^+ removal:** **1. Buffer systems** **2. Exhalation of CO_2** **3. Real secretion**		
15	3	Acid- Base Disorders.	▪ **Disorders of hydrogen ion homeostasis:** **1. Metabolic acidosis** **2. Metabolic alkalosis** **3. Respiratory acidosis** **4. Respiratory alkalosis** ▪ **Laboratory assessment of hydrogen status** ▪ **Clinical cases**		

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

1. Course Name:

Clinical Laboratory Training

2. Course Code:

515

3. Semester / Year:

The first / The fifth year

4. Description Preparation Date:

2025\4\26

5. Available Attendance Forms:

Attendance in lecture

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/

Course Description

1. Course Name:
Public health
2. Course Code:
415
3. Semester / Year:
First semester/ fourth year
4. Description Preparation Date:
23.4.2025
5. Available Attendance Forms:
Attendance in lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours / 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 health, the art of preventing the spread of diseases, promoting for health through organizations.
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	Health-careinIraq, measuring and evaluating the public health	Boards, powerpoints, figures, pictures	Quizzes, , midterm exam, final

					exam
2	2	Population screening	Population screening and public health data , prevention of non communicable diseases		
3	2	Infectious diseases	Control of infectious diseases& immunization plan		
4	2	Communicab diseases	Gastrointestinal diseases, skin infections, respiratory tract infections.		
5	2	Major hea problems	Obesity, physical activity, dental health, liver diseases		
6	2	Nutritional disorders	Family health		
7	2	Environment health	Occupational health		
8	2	Travel health	Pharmacy practice		
9	2	Health ca system	Health promotion		
10	2	Pharmaceuti care planning	Ph. Care strategy		
11	2	Community pharmacy	Community pharmacy manaagment		
12	2	Hospital pharmacy services	Hospital pharmacy services		
13	2	Pharmacy practice	Biosafety in pharmacy		
14	2	Formulary	Regulatory affair		

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