COURSE SPECIFICATION

This academic description outlines the exploration of foundational principles in organic chemistry crucial for understanding pharmacy. It involves scrutinizing organic chemical structures and functional groups, including aldehydes, ketones, and heterocyclic compounds, emphasizing their definition, properties, nomenclature, and interactions, particularly in relation to pharmaceutical compounds. Additionally, it encompasses the study of qualitative analysis methods employed for identifying functional groups in organic compounds.

1. Educational institution	Al-ayen Iraqi University - College of Pharmacy
2. College department/Center	Pharmaceutical chemistry
3. Course title/code	Organic Chemistry II **PH2101**
4. Modes of Attendance offered	Full-time and official attendance hours
5. Semester/Year	First semester 2023-2024
6. Credits (total)	45 hrs+30 hrs practical
7. Date of description form preparation//Revision of this specification	1/10/2023

8. Course Objectives

1- Examining the concepts and foundations of organic chemistry that establish the understanding of the principles of pharmacy

2- Study of organic chemical structures and functional groups (such as: aldehydes, ketones, carboxylic acids, carboxylamine derivatives, nitriles, and other nitrogenous organic compounds, heterocyclic compounds, and carbohydrates), so that the focus is on analyzing their definition, structure, properties, and chemical nomenclature, And the interactions in which it participates, and the relationship between it and some pharmaceutical compounds.

3- Study the analysis methods that are used for qualitative discovery in organic compounds (analysis of functional groups in organic compounds).

9. Learning Outcomes, Teaching, Learning and Assessment Method

A-Cognitive goals

1- How to deal with organic chemical compounds and their interactions.
2- How to deal with scientific devices.
3- Learn to use different scientific techniques.
4- Knowing the methods used to prepare organic compounds.

B-The skills goals special to the course

1 - Equalization of skill in preparing vehicles and medicines
2 - Gain skill in using different methods in manufacturing and preparing medicines
3 - Gain skill in how to deal with chemical compounds
4- Gain skill in writing scientific reports.

Teaching and Learning Methods

Seminars - daily assignments - written exams

Assessment methods

1- Short MCQs
2- Oral exam and direct questions in the class
3- Midterm exam
4- Electronic exams on the electronic platform
5- Final exam

C-Affective and value goals

C 1- Enhancing students' understanding by linking theoretical aspects to practical aspects, by conducting investigations and studying the chemical and physical properties of compounds.

C 2- Enhancing students' ability to think and analyze effectively.

C3- Enhancing students' ability to work as a research team, to develop effective cooperation and interaction skills in a team environment.

C4- Enhancing students' ability to ask objective questions and participate in scientific discussions, to stimulate the spirit of inquiry and interaction in the educational process.

Teaching and Learning Methods

-Providing the student with the basics and topics related to knowledge
-Clarification and explanation of study materials by the teaching staff
-Asking students to visit the library to obtain academic knowledge
-Request reports and seminars on the topics covered

Assessment methods

Daily tests with multiple choice questions for academic subjects
Participation grades for difficult competition questions
Make reports
Daily duties

D-General and rehabilitative transferred skills (other skills relevant to employability and personal development)

D1- Acquire the skill of safe handling of chemicals and glassware.

D 2- Acquire the skill of writing scientific reports and research accurately and effectively.

D 3- Acquire skill in implementing chemical diagnosis methods for chemical substances.

D 4- Acquire skill in using books and modern educational means to achieve personal development and develop educational capabilities.

10. Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1-2	6	1A,2A, ,1B,2B,3B,4B,1C,2C, ,4C,1D,2D,3D,4D	Benzene and aromatic compounds	1- Whiteboard and PowerPoint and data show presentation 2- Class discussion	1- Short MCQs 2- Oral exam and direct questions in the class 3- Midterm and final exam
3-4	6	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C, 3D,4D	Electrophilic Aromatic Substitution		
5.	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Carboxylic acids		
6.	2	1A,2A,3A,4A,1B,2B,3B, ,2C,3C,4C,1D,2D,3D,4D	Functional Derivatives of Carboxylic acids		
7.	2	1A,2A,3A,4A,1B,2B,3B, ,2C,3C,4C,1D,2D,3D,4D	Functional Derivatives of Carboxylic acids		
8.	2	1A,2A,3A,4A,1B,2B, ,1C,2C,3C,4C,1D,2D,3D	Amin I		
9	3	1A,2A,3A,4A,1B,2B, ,1C,2C,3C,4C,1D,2D,3D,	Amin II		
10-11.	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Aldehydes and ketones (included aldol and Claisen condensation);		
12.	3	1A,2A, ,4A,1B,2B,3B,4B,1C, ,3C,4C,1D,2D,3D,4D	Aldehydes and ketones reactions and properties		
13.	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C, ,3D,4D	Phenols.		
14	3	1A,2A,3A, ,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Phenols reactions and properties		
15.	3		Final Examination		

10. Laboratory Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Solubility class	1- Whiteboard and PowerPoint and data show presentation 2- Class discussion 3- practical experiment	1- Short MCQs 2- Oral exam and direct questions in the class 3- Midterm exam 4- Final exam
2.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Solubility class (quiz- unknown)		
3.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Identification of Alcohols		
4.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Identification of Alcohols (quiz- unknown)		
5.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Identification of Phenols		
6.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Identification of Phenols (quiz-)unknow		
7.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Identification of Aldehydes and ketones		
8.	2		Mid Examination		
9.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Identification of Aldehydes and ketones (quiz- unknown)		
10.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Identification of Carboxylic acid		
11	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Identification of Carboxylic acid (quiz- unknown)		
12	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Identification of Amines		
13	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Identification of Salt of carboxylic acid		
14	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Identification of Salt of carboxylic acid (quiz- unknown)		
15			Exam		

11. Infrastructure	
Books Required reading	Organic Chemistry by Robert T. Morrison and Robert N. Boyd . Organic Chemistry by McCurry; 9th ed. Thomason learning; CA,USA; 2015
Main references (sources)	Organic Chemistry by Robert T. Morrison and Robert N. Boyd . Organic Chemistry by McCurry; 9th ed. Thomason learning; CA,USA; 2015
Recommended books and references (scientific journals, reports…).	**Scientific journals**
Electronic references, Internet sites…	**Websites of Universities**

12. Course development plan
Course planning takes place in two main stages. In the first stage, course specifications are written, while the second stage focuses on preparing the course plan as a basis for comprehensively leading the educational process, both in implementation and evaluation. The main goal of this planning is to achieve effective communication between students and faculty. This process seeks to support students in assessing their readiness for the course, and to enable them to self-regulate their learning process. In addition, the process seeks to monitor the progress of student achievement and provide a basis for evaluating the course and understanding how much students are benefiting from it.

COURSE SPECIFICATION

Organic Chemistry III explores the classification, properties, preparation, and reactions of heterogeneous organic compounds, emphasizing heterocyclic chemistry with a focus on nitrogen, sulfur, and oxygen-containing rings crucial for pharmaceutical sciences. Specific compounds like pyrrole, furan, thiophene, pyridine, quinolines, and isoquinolines are analyzed for their properties, nomenclature, interactions, and synthesis. The curriculum also covers qualitative detection methods for compounds containing heterogeneous rings, enhancing understanding of their nature and interactions.

1. Educational institution	Al-ayen Iraqi University - College of Pharmacy
2. College department/Center	Pharmaceutical chemistry
3. Course title/code	Organic chemistry III **PH 2201**
4. Modes of Attendance offered	Full-time and official attendance hours
5. Semester/Year	Second semester 2023-2024
6. Credits (total)	45 hrs+ 30 hrs practical
7. Date of description form preparation//Revision of this specification	1/10/2023

8. Course Objectives

1- In Organic Chemistry 3, we carefully examine the classification, properties, preparation, and reactions of heterogeneous organic compounds. This study highlights the fundamentals of heterocyclic chemistry, with a superior focus on some rings that include elements such as nitrogen, sulfur, and oxygen, which represent an essential basis for the study of pharmaceutical sciences. We analyze in detail specific compounds such as pyrrole, furan, thiophene and pyridine, as well as quinolines and isoquinolines, focusing on their properties, nomenclature, interactions and how to prepare them.

2- In addition, the study delves into methods for the qualitative detection of

compounds containing heterogeneous rings, such as drugs and organic compounds, to provide a comprehensive view of the nature of these compounds and their interactions.

9. Learning Outcomes, Teaching, Learning and Assessment Method

A-Cognitive goals

A1 - Dealing with chemical compounds:
In this context, it determines how to interact with chemical compounds safely and effectively, promoting a deep understanding of chemical properties and interactions. It seeks to achieve cognitive goals related to classifying compounds, understanding reaction mechanisms, and analyzing physical and chemical properties.

A2 - Dealing with scientific equipment:
Here emphasis is placed on how to use and deal with various scientific instruments, such as measuring and spectroscopic instruments, nuclear magnetic spectroscopy, and others. This aims to develop skills in safe and accurate operation of these devices to obtain accurate and reliable data.

A3 - Learning using different scientific techniques:
This part includes how to analyze data and use different scientific techniques, such as chromatographic and spectroscopic techniques, to analyze and interpret the results. It aims to develop analytical thinking skills and sound scientific analysis.

A4 - Knowing the methods used in preparing medicines:
This point focuses on understanding the processes and methods used in preparing medicines, from the selection of raw materials to the complex chemical preparation processes. It aims to provide students with a comprehensive understanding of drug manufacturing processes and identify the important stages in these processes.

B-The skills goals special to the course

B1 - Acquiring skill in preparing compounds and medicines:
This objective aims to develop students' skills in preparing chemical compounds and drugs in efficient and accurate ways, with an emphasis on the main chemical steps and safety in handling chemicals.

B2 - Acquire skill in using different methods in manufacturing and preparing medicines:
This objective aims to guide students towards understanding and using a variety of methods and techniques in the manufacture and preparation of drugs, allowing them to effectively deal with the challenges of manufacturing organic compounds.

B3 - Acquiring skill in how to deal with chemical compounds:
This goal aims to enhance skills in dealing with chemical compounds safely and effectively, including controlling environmental conditions and using personal protective equipment.

B4 - Acquiring the skill in writing scientific reports:
This goal includes developing scientific report writing skills, including documenting experiments, analyzing data, and formulating results accurately and systematically. It aims to develop students' abilities in effective scientific expression and correctly explaining chemical relationships.

Teaching and Learning Methods

Seminars - daily assignments - written exams

Assessment methods

Oral and written exams - scientific reports

C-Affective and value goals

1C - Enhancing students' understanding by linking the theoretical aspect to the practical aspect, by conducting the detection and study of the chemical and physical properties of heterocyclic compounds, and linking this to medicines that contain these rings.

2c - Enhancing students' ability to think and deeply analyze chemical and pharmaceutical topics.

3C - Enhancing students' ability to work as a research team, which contributes to developing cooperation skills and effective interaction with colleagues.

4c - Enhancing students' ability to ask objective questions and participate in scientific discussions, which encourages effective interaction and constructive interaction within the classroom.

Teaching and Learning Methods

-Providing the student with the basics and topics related to knowledge
-Clarification and explanation of study materials by the teaching staff
-Asking students to visit the library to obtain academic knowledge
-Request reports and seminars on the topics covered

Assessment methods

Oral and written exams-scientific reports

D-General and rehabilitative transferred skills (other skills relevant to employability and personal development)

1D- Acquiring skill in dealing with chemicals and glassware, which contributes to developing safety and efficiency skills in various chemical processes.

2D - Acquiring the skill in preparing scientific reports and research in a thoughtful and systematic manner, which enhances students' abilities to express scientifically and transmit information effectively.

3D- Acquiring skill in chemical diagnosis methods for chemical substances, which enhances students' understanding of chemical analysis processes and interpretation of results.

4D - Acquiring skill in using books and modern teaching aids, which enhances students' ability to research and benefit from available sources to develop their understanding and knowledge of chemistry.

10. Theory Course Structure					
Week	**Hrs.**	**ILOs**	**Unit/Module or Topic Title**	**Teaching methods**	**Assessment methods**
1-3	6	1A,2A,3A,4A,1B,2B,3B,4B, 1C,2C,3C,4C,1D,2D,3D,4D	Heterocyclic system: Classes of heterocyclic systems; general structures; properties; Occurrence in nature and in medicinal products.	1- Whiteboard and PowerPoint and data show presentation 2- Class discussion	1- Short MCQs 2- Oral exam and direct questions in the class 3- Midterm exam 4- Final exam
4-6	6	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Five-membered ring heterocyclic compounds: pyrrole; furan and thiophen.		
7-8	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Electrophilic substitution in pyrrole, furan and thiophen: Reactivity and orientation.		
9-10	4	1A,2A,3A,4A,1B,2B,3B,4B,1C ,2C,3C,4C,1D,2D,3D,4D	Six-membered ring heterocyclic compounds: Structure of pyridine. Basicity of pyridine. Reactions of pyridine		
11-13	6	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Saturated five- membered heterocyclic compounds.		
14-15	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Saturated five- membered heterocyclic compounds.		

10. Laboratory Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Synthesis of derivatives	1- Whiteboard and PowerPoint and data show presentation 2- Class discussion	1- Short MCQs 2- Oral exam and direct questions in the class 3- Midterm exam 4- Final exam
2.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Oxidation of arenes		
3.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Oxidation of arenes (quiz &unkown)		
4.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Preparation of esters		
5.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Preparation of esters(quiz &unkown)		
6.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Hydrolysis of esters		
7.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Hydrolysis of esters(quiz &unkown)		
8.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Mid Examination		
9.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Mid Examination		
10.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	(amides)		
11	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Preparation of amides		
12	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Preparation of amides (quiz-unknown)		
13	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	picric acid		
14	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Preparation of picric acid		
15	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Preparation of picric acid (quiz- unknown)		

11. Infrastructure	
Books Required reading	Organic Chemistry by Robert T. Morrison and Robert N. Boyed, latest edition. Organic Chemistry by J. McMurry, latest ed., Thomason learning, CA, USA. An introduction to the chemistry of heterocyclic compound by Acheson, R. M. latest ed.
Main references (sources)	Organic Chemistry by Robert T. Morrison and Robert N. Boyed, latest edition. Organic Chemistry by J. McMurry, latest ed., Thomason learning, CA, USA. An introduction to the chemistry of heterocyclic compound by Acheson, R. M. latest ed.
Recommended books and references (scientific journals, reports…).	**Scientific journals**
Electronic references, Internet sites…	**Websites of Universities**

12. Course development plan
Developing academic curricula to suit the development in chemical structures, adding preparation methods and reactions that keep pace with current developments, and using appropriate conditions for each reaction while ensuring quality of life and health in dealing with these reactions.

Course Description Form

Course Description

This course description provides a succinct summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the learning opportunities available. It must be linked to the description of the program.

1. Educational Institution	Al Ain Iraqi University - Faculty of Pharmacy
2. Scientific Department/ Center	Laboratory and Clinical Sciences
3. Course Code	Medical Microbiology-1-PH2102
4. Available Attendance Forms	Courses – Attendance
5. 3-semester/ year	Semester II 2023-2024
6. Number of study hours (total)	45 hours
7. Date this description was prepared	1/10/2023

8. Course Objectives

The Medical Microbiology 1 course for students of the Faculty of Pharmacy aims to provide students with a comprehensive understanding of microbiology and its effects in the medical context, focusing on bacteria, viruses, fungi, and parasites. These objectives include:

1. Understand the basics: Learn the basic characteristics of microorganisms and their importance in health and disease.
2. Knowledge of classification and structure: Recognize the classification of microorganisms and understand their cellular structure and functions.
3. Mechanisms of infection and resistance: Study of how infection is transmitted and mechanisms of resistance in microorganisms.
4. Laboratory Techniques: Learn to use basic laboratory techniques to isolate and identify microorganisms.
5. Prevention and treatment: Understand the methods used in the prevention and treatment of microscopic diseases, including antibiotic use and resistance.
6. Clinical applications: Apply knowledge to clinical scenarios to improve understanding and management of infectious diseases.
7. Ethics and safety in the laboratory: Promote safe and ethical working practices in the laboratory.
8. Critical thinking and problem solving: Developing critical thinking skills and the ability to solve problems related to medical microbiology.
9. Scientific research: Encouraging students to pursue research and keep abreast of the latest developments in the field of medical microbiology.

These objectives aim to prepare pharmacy students to understand the role of microorganisms in health and disease, and to enable them to contribute effectively to the prevention and treatment of infectious diseases.

9. Course Outcomes and Teaching, Learning and Evaluation Methods

A- Knowledge Objectives.

The knowledge objectives of the course of Medical Microbiology 1 for students of the Faculty of Pharmacy focus on providing students with basic and advanced knowledge about microorganisms and their effects on human health. These objectives include:

1. Recognize microorganisms: Understand the classification of microorganisms including bacteria, viruses, fungi, and parasites, and distinguish them from each other.

2. Understanding the mechanisms of infection: Knowing how microorganisms move and cause infection in the organism, and the natural defense mechanisms of the body against them.

3. Recognize the principles of resistance: Understand the concepts of antibiotic resistance and the mechanics that microorganisms develop to resist treatments.

4. Principles of laboratory diagnosis: Acquire knowledge about basic laboratory techniques for isolating, identifying, and testing the sensitivity of microorganisms.

5. Treatment and prevention: Understand the strategies used to prevent and treat microscopic diseases, including the use of vaccines and antibiotics.

6. Clinical applications: Apply the knowledge gained to clinical cases to understand the relationship between microorganisms and the diseases they cause.

7. Laboratory Safety and Ethics: Promote knowledge of biosafety practices and ethics related to working in medical laboratories.

8. Developing research skills: Encouraging students to use scientific sources and research literature to update their knowledge and follow the latest developments in the field of medical microbiology.

9. Critical Thinking: Developing students' ability to think critically and analyze laboratory and clinical data to make informed decisions in medical contexts.

By achieving these cognitive goals, pharmacy students become equipped with the knowledge needed to understand the role of microorganisms in health and disease, enhancing their contribution to the prevention and treatment of infectious diseases.

B - Course Skills Objectives

The skill objectives of the Medical Microbiology 1 course for Pharmacy students focus on developing specific practical and applied skills that enable students to work effectively in laboratories and medical contexts. These objectives include:

1. Laboratory Skills: Learn how to safely and accurately use laboratory equipment to isolate and identify microorganisms.

2. Coloring and cultivation techniques: Gain the ability to perform various coloring techniques and cultivate microorganisms for analysis.

3. Sample Analysis: Develop the ability to evaluate and analyze biological samples to detect pathogens.

4. Infection Control Procedures: Learn how to apply infection control and biosafety procedures in the laboratory.

5. Interpreting the results: Developing the skill of interpreting the results of laboratory tests and linking them to clinical cases.

6. Antibiotic Handling: Gain the ability to conduct and interpret antibiotic sensitivity tests.

7. Teamwork and Communication: Improve teamwork and communication skills within the lab team.

8. Critical Thinking and Problem Solving: Enhance the ability to use critical thinking and problem-solving skills in identifying and addressing laboratory issues.

9. Ongoing research and updating: Encourage students to continuously research and update their skills and knowledge in the field of medical microbiology.

By achieving these goals, pharmacy students acquire the necessary skills to excel in the field of medical microbiology, enhancing their ability to contribute to the effective diagnosis and treatment of infectious diseases.

Teaching & Learning

Teaching and learning methods for the medical microbiology course 1 for students of the Faculty of Pharmacy include various techniques aimed at enhancing theoretical understanding and developing practical skills. Here are some basic methods:

1. Lectures: Provide basic theoretical information about microorganisms, infection mechanisms, and methods of treatment and prevention.

2. Practical laboratories: Conduct laboratory experiments to learn coloring techniques, cultivation, and identification of microorganisms.

3. Current studies: Analyze realistic clinical scenarios to apply theoretical knowledge in practical contexts.

4. Group work: Implementing group projects to encourage cooperation and knowledge exchange among students.

5. Problem-Based Learning (PBL): Solving complex problems associated with microbiology to stimulate critical thinking and self-learning.

6. Presentations: Students give presentations on specific topics to enhance research and communication skills.

7. Tests and Assessments: Conduct periodic tests to assess progress and students' understanding of the material.

8. Using technology: Integrating e-learning tools such as virtual reality and simulation to provide immersive learning experiences.

9. Seminars and workshops: Hosting microbiology experts to present the latest developments and technologies in the field.

10. Self-learning: Encouraging students to research and stay informed by accessing reliable scientific sources and references.

Using these modalities, a holistic learning experience that combines theory and practice is provided, helping pharmacy students develop the knowledge and skills needed for the field of medical microbiology.

Valuation Methods

Evaluation methods in the Medical Microbiology 1 course for Pharmacy students include a variety of methods to measure students' understanding and their practical and theoretical skills. These methods include:

1. Theoretical tests: Evaluate students' understanding of basic and detailed concepts through written tests that include objective and essay questions.

2. Laboratory reports: Evaluating students' practical skills and ability to carry out laboratory experiments, accurately recording results, and analyzing them.

3. Presentations: Assess students' ability to gather and present information related to a particular topic in medical microbiology, with an emphasis on effective interaction and communication.

4. Research projects: Evaluating the ability to apply theoretical knowledge in solving real scientific problems, and encouraging scientific research and investigation.

5. Practical performance tests: Evaluate students' skills in carrying out laboratory procedures accurately and safely, including the use of equipment, coloring techniques and cultivation.

6. Participation and attendance: Assess students' commitment to active participation in lectures and laboratory exercises, and their contribution to the learning environment.

7. Quizzes and assignments: Evaluate ongoing knowledge and students' understanding of new topics through short quizzes and regular assignments.

8. Self-assessment and peer assessment: Encourage students to evaluate their own performance and that of their peers, which helps develop self-awareness and critical assessment skills.

These diverse modalities serve a holistic assessment of students, ensuring their deep understanding of the material and their ability to apply knowledge in practical contexts.

C- Emotional and value objectives

The Emotional and Valuable Objectives of the Medical Microbiology 1 course for Pharmacy students aims to develop professional behaviors, attitudes, and values that promote the ethical and responsible role of students in the field of health. These objectives include:

1. Appreciate the medical importance of microbiology: Develop a respect and appreciation for the role of microorganisms in health and disease and the importance of understanding them in the development of treatments.

2. Commitment to professional ethics: Promote adherence to ethical standards and social responsibility in dealing with medical information and biological samples.

3. Biosafety Awareness: Develop biosafety awareness, in vitro infection prevention and medical practice.

4. Developing compassion and empathy: Encourage students to develop compassion and empathy for patients and understand the impact of infectious diseases on the lives of individuals.

5. Personal and Professional Responsibility: Promoting a sense of personal and professional responsibility in providing safe and effective health care.

6. Collaboration and Teamwork: Develop collaboration and teamwork skills with colleagues and other healthcare professionals.

7. Respect for biodiversity: appreciation of the biodiversity of microorganisms and its importance in the environment and public health.

8. Continuous Development and Lifelong Learning: Encourage students to commit to continuous professional development and lifelong learning in the field of medical microbiology.

9. Initiative and Innovation: Motivate students to initiate and innovate in the search for new solutions to infectious disease problems and improve treatment and prevention methods.

By achieving these goals, students are prepared to become responsible and empathetic health professionals, able to contribute effectively to public health and pharmaceutical care.

Teaching & Learning

To achieve the emotional and value objectives in the course of Medical Microbiology 1 for students of the Faculty of Pharmacy, several effective teaching and learning methods can be followed:

1. Group discussions: Organize discussion sessions that encourage an exchange of views and reflection on ethical and professional issues related to microbiology and public health.

2. Case study: Using real-life case studies to analyze ethical and professional situations, which promotes critical thinking and empathy.

3. Service learning: Engaging students in service projects that link academic knowledge to health needs in the community, to promote social awareness and responsibility.

4. Guest lectures: Invite professionals from different health fields to share their experiences and highlight the emotional and value importance of their work.

5. Workshops on ethics and safety: Organize specialized workshops focusing on professional ethics and safety standards in scientific research and medical practice.

6. Research Projects: Encourage students to conduct research on compassionate and value issues in the field of microbiology, such as the impact of antibiotics on society.

7. Self-assessment and reflection: Motivate students to reflect on their personal and professional values through self-assessment and reflection, which promotes emotional development.

8. Simulated interactions: Using simulated laboratory or clinical scenarios that require students to make decisions that reflect their understanding of ethics and safety.

9. Participation in forums and conferences: Encouraging students to participate in forums and conferences that address the emotional and value aspects of health sciences.

Applying these modalities, awareness and appreciation of the affective and value dimensions associated with medical microbiology can be enhanced, leading to the formation of integrated and socially responsible pharmacists.

Valuation Methods

To assess the affective and value objectives in the Medical Microbiology 1 course for pharmacy students, various assessment methods can be used that focus on measuring development in attitudes, values, and behaviors. These modalities include:

1. Observation: Evaluating students' behavior and the extent to which they participate and interact in group activities, discussions, and workshops that promote ethical and professional values.

2. Personal and Reflective Journals: Encourage students to write reflective journals about their experiences and learning related to emotional and value

goals, and evaluate these journals to understand the evolution of their perspectives.

3. Make presentations: Evaluate students' presentations on specific ethical or sentimental issues in the field of medical microbiology, to gauge their understanding and ability to analyze these issues.

4. Community service projects: Evaluating students' participation in community service projects that reflect the application of professional values and ethics in realistic contexts.

5. Peer Assessment: Using peer assessments to get feedback from fellow students about participating in group activities and contributing to fostering a respectful and collaborative learning environment.

6. Quizzes and essays: Use quizzes or essays to assess students' understanding of ethical and value-based principles and their ability to apply these principles in specific scenarios.

7. Guided Discussions: Evaluate students' participation and contributions to guided discussions on emotional and value issues, to measure their degree of interaction and critical thinking.

8. Self-assessment: Using self-assessment tools to encourage students to assess their personal and professional development relative to the emotional and value goals of the course.

(d) Transferred general andqualifying skills (other skills related to employability and personal development).

The Medical Microbiology 1 course for students of the Faculty of Pharmacy aims not only to provide students with specialized scientific knowledge, but also to develop a set of general and qualifying skills that enhance their employability and contribute to their personal and professional development. These skills include:

1. Critical thinking and problem solving: Enhance the ability to analyze information, critically evaluate data, and develop solutions to complex problems, especially those related to diagnosis and treatment.

2. Research and Investigation Skills: Develop the ability to conduct scientific research and investigate issues related to microbiology, including the use of scientific databases and the interpretation of results.

3. Effective Communication: Improve the ability to communicate clearly and effectively, both in writing and orally, with various audiences, including colleagues, health professionals, and the public.

4. Teamwork: Enhancing the ability to work effectively within multidisciplinary teams, with an emphasis on mutual respect, cooperation, and coordination.

5. Technological skills: Developing the ability to use modern technology related to laboratories and scientific research, including laboratory devices, analytical software, and electronic databases.

6. Time management and work organization: Learn how to efficiently organize time and tasks to achieve set goals, with an emphasis on priorities and flexibility.

7. Self-learning and continuous development: Encourage students to adopt an attitude of continuous learning and seek opportunities for personal and professional development outside the classroom.

8. Ethical Awareness and Professional Responsibility: Promote an understanding and appreciation of ethical issues and professional responsibility, especially in relation to the handling of sensitive information and biological samples.

9. Resilience and Adaptation: Developing the ability to adapt to changing environments and new challenges, which enhances the ability to work in different areas within the health sector.

By developing these skills, graduates of the Medical Microbiology course become strong candidates for employment and gain a solid foundation for success in their careers and personal development.

10. 10. Course Structure					
Week	**Hours**	**Learning outcomes required for the program***	**Module Name/ or Topic**	**teaching method**	**Valuation Method**
1	2	A1 , A2 , A3, B1, B2,B3 ,C1	**Importance of microbiology, History of microbiology an Anatomy of bacteria: Surface appendage, Capsule, Cell wall of G. +ve & G-ve bacteria,** Cytoplasmic membrane and Morphology of Bacteria, Staining and Classification	Lecturing and discussing in-person and data show	Written and oral tests and direct questions
2	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	. Bacterial physiology: Physical and chemical growth determinate, growth and growth curves, bacterial reproduction		
3	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Genetics: Definition, genetic, element, mutation (spontaneous, gene transfer, transformation, conjugation, and gene transduction).		
4	2	A1 , A2 , A3,A4, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Recombinant DNA biotechnology and Sporulation and germination		
5	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	. Sterilization (chemical + physical Methods).		
6	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Chemotherapy.and Antibiotic		
	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,D1,D2,D3 ,D4,D5	**Importance of microbiology, History of microbiology**		

			an Anatomy of bacteria: Surface appendage, Capsule, Cell wall of G. +ve & G-ve bacteria, Cytoplasmic membrane and Morphology of Bacteria, Staining and Classification		
7	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	. Bacterial physiology: Physical and chemical growth determinate, growth and growth curves, bacterial reproduction		
8	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Genetics: Definition, genetic, element, mutation (spontaneous, gene transfer, transformation, conjugation, and gene transduction).		
9	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	. Bacterial physiology: Physical and chemical growth determinate, growth and growth curves, bacterial reproduction		
10	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	Genetics: Definition, genetic, element, mutation (spontaneous, gene transfer, transformation, conjugation, and gene transduction).		
11	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	. Bacterial physiology: Physical and chemical growth determinate, growth and growth curves, bacterial		

			reproduction		
12	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Genetics: Definition, genetic, element, mutation (spontaneous, gene transfer, transformation, conjugation, and gene transduction).		
13	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	. Bacterial physiology: Physical and chemical growth determinate, growth and growth curves, bacterial reproduction		
14	1	A1 , A2 , A3, B1, B2,B3 ,C1	Genetics: Definition, genetic, element, mutation (spontaneous, gene transfer, transformation, conjugation, and gene transduction).		
15	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Revisions and final exam		

The detailed course schedule of the Medical Microbiology I course at the Faculty of Pharmacy, which organizes the content in weekly parts. This construction is designed to cover core topics within medical microbiology, focusing on bacterial anatomy and physiology, microbial genetics, and the basics of microbiology, including its history and significance.

Week	Hours	Learning outcome	Venue/Subject Address	Teaching Methods	Assessment methods
1	3	Understand the importance and history of microbiology.	The Importance of Microbiology, History of Microbiology	Lecture, PowerPoint Presentations	Multiple Choice Examination Question
2	3	To know the anatomy of bacteria.	Anatomy of bacteria: superficial appendages, capsules, cell walls	Interactive Lecture	Short Answer
3	3	Learn about the cytoplasmic	Cytoplasmic membrane and	Lecture, practical	Multiple Choice

		membrane and the morphology of bacteria.	bacterial morphology	sessions using microscopes	Examination Questions
4	3	Exploring bacterial staining and grading techniques.	Dyeing and grading	Group Discussion, Practical Sessions	Laboratory reports, verbal presentation
5	3	Understand the physiology and growth of bacteria.	Bacterial Physiology: Growth Determinants, Growth Curves, Reproduction	Laboratory Practical Training, Case Studies	Written Assignment, Practical Exam
6	3	Study of bacterial genetics and mutation processes.	Inheritance: mutation, gene transfer methods	Seminar, student presentations	Bid Evaluation, Multiple Choice Questions
7	3	Dive deeper into bacterial genetics and biotechnology.	Biotechnology for recombinant DNA, spore and germination	Interactive Lecture	Quiz, Peer Review
8	3	Learn sterilization techniques and their applications.	Sterilization: Chemical and Physical Methods	Lecture, practical sessions	Practical Exam, Short Answer Questions
9	3	Exploring the principles of chemotherapy and antibiotics.	Chemotherapy and antibiotics	Case studies, group activities	Written assignment, laboratory reports
10	3	Review and integrate knowledge from previous weeks.	Full review	Review Lectures, Q&A Sessions	Comprehensive testing, peer review

Teaching Methods:

- **Lectures and PowerPoint presentations: to introduce and provide a basic understanding of microbiology concepts.**
- **Interactive lectures and videos: to increase interest and clarify complex processes.**
- **Practical sessions**

11. Infrastructure

Required textbooks	1. "Microbiology: An Introduction" by Gerard J. Tortora, Berdell R. Funke, and Christine L. Case: - This book is a comprehensive reference for microbiological principles, with extensive coverage of bacteria, viruses, fungi, and parasites, as well as infection and immune mechanisms. 2. "Medical Microbiology" by Patrick R. Murray, Ken S. Rosenthal, and Michael A. Pfaller: - This book focuses specifically on medical microbiology, offering an in-depth look at pathogens and infectious diseases, including diagnostic and treatment strategies. 3. "Brock Biology of Microorganisms" by Michael T. Madigan, John M. Martinko, Kelly S. Bender, Daniel H. Buckley, and David A. Stahl: - This book provides a comprehensive overview of the world of microbiology, with an emphasis on molecular biology, genomics, and evolution, along with medical and environmental applications. 4. "Prescott's Microbiology" by Joanne Willey, Linda Sherwood, and Christopher J. Woolverton: - This book provides a deep understanding of microbiology with a focus on the molecular mechanisms of microorganisms and their impact on humans and the environment. 5. "Clinical Microbiology Made Ridiculously Simple" by Mark Gladwin, William Trattler, and C. Scott Mahan: 1- -This book is an ideal resource for students seeking a simplified explanation of difficult concepts in medical microbiology, with an emphasis on clinical applications.
Main References	: 1. "Medical Microbiology" by Patrick R. Murray, Ken S. Rosenthal, and Michael A. Pfaller: This book is a comprehensive resource covering the fundamental and

	clinical aspects of medical microbiology, with a focus on bacteria, viruses, fungi, and parasites. 2. "Brock Biology of Microorganisms" by Michael T. Madigan, John M. Martinko, Kelly S. Bender, Daniel H. Buckley, and David A. Stahl: This book provides a comprehensive overview of microbiology, focusing on the molecular and cellular aspects of microbes and their applications in health and disease. 3. "Clinical Microbiology Made Ridiculously Simple" by Mark Gladwin and Bill Trattler: This book provides a simplified introduction to difficult concepts in medical microbiology, making it ideal for students seeking a clear and concise explanation. 4. "Microbiology: An Introduction" by Gerard J. Tortora, Berdell R. Funke, and Christine L. Case: This book is an excellent introduction to microbiology, focusing on theoretical foundations and practical applications. 5. "Principles of Virology" by S. Jane Flint, Vincent R. Racaniello, Glenn F. Rall, and Anna Marie Skalka: This book provides a deep understanding of virology, covering the structural and functional aspects of viruses and their impact on the organism. 6. Electronic databases and scientific journals: such as PubMed and ScienceDirect, to access the latest research and articles in the field of medical microbiology.
) **Recommended books and references (scientific journals,reports ,.....)**	In addition to the textbooks for the Medical Microbiology 1 course for students of the Faculty of Pharmacy, a range of additional references, including scientific journals and reports, are also recommended to deepen understanding and keep abreast of the latest developments in the field. Recommended resources C/N H. Roldos de la Sovera, Montevideo 1. Journal of Clinical Microbiology: publishes research on microbiological diagnosis, epidemiology, and treatment. 2. Clinical Microbiology Reviews: Provides comprehensive reviews on various topics in clinical microbiology. 3. Microbes and Infection: Focuses on the relationship between microorganisms and human and animal diseases.

	4. Infection and Immunity: Covers research on interactions between pathogens and host defense systems. Reference Books: 1. "Principles of Virology" by S. Jane Flint, Vincent R. Racaniello, Glenn F. Rall, Anna Marie Skalka: An in-depth reference on viruses and their mechanisms of action. 2. "Mims' Medical Microbiology and Immunology" by Richard Goering, Hazel Dockrell, Mark Zuckerman, Peter L. Chiodini: Offers a clear understanding of the fundamentals in microbiology and immunity. 1. Centers for Disease Control and Prevention (CDC) - Microbiology: Provides information and updates on microbiological topics and infectious diseases. 2. World Health Organization (WHO) - Infectious Diseases: Provides reports and guidance on the prevention and control of infectious diseases. 3. PubMed: A database of medical publications and research, useful for researching recent scientific articles in medical microbiology. 4. ScienceDirect: A source for accessing scientific research and articles in various fields of science including microbiology. Having access to these scientific references and journals helps students deepen their understanding of the material and keeps their knowledge up-to-date with the latest developments in the field of medical microbiology.
) **Electronic references,websites ,.....**	© 2018 UpToDate. Lexicomp

12. Course Development Plan

To develop the medical microbiology course 1 for students of the Faculty of Pharmacy, the plan includes needs analysis, updating the content with the latest research, integrating active learning and technology, enhancing evaluation and feedback, collaborating to expand knowledge, and focusing on professional and continuous development. This approach aims to improve the effectiveness of education and equip students with up-to-date skills and knowledge.

Course Description Form

Course Description

This course description provides a succinct summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the learning opportunities available. It must be linked to the description of the program.

1. Educational Institution	Al Ayen Iraqi University - Faculty of Pharmacy
2. Scientific Department/ Center	
3. Course Code	Medical Microbiology 2-PH2202
4. Available Attendance Forms	Courses – Attendance
5. 3-semester/ year	Semester II 2023-2024
6. Number of study hours (total)	45 hours
7. Date this description was prepared	1/10/2023

8. Course Objectives

Studying the methods of parasites, especially those that cause epidemic diseases, and limiting their spread. In addition, studying the internal structure of pathogens and their characteristics, classifying them according to their component genome, as well as studying the factors affecting them, whether physical or chemical, and the extensive study of parasitic diseases, and using the best effective drugs according to the location of the effect of the pathogen's life cycle, how to control and prevent the spread of diseases, and following the best ways to control the sources of pollution resulting from the presence of these pathogens in the resources used by humans as sources of form and drink. This is done after full knowledge of these pathological parasites in all aspects Physiological and biological, and their various qualities and components that are considered

As auxiliary factors or being one of the causes of the pathogenic severity of the microbe, in addition to the comprehensive study of some viruses that cause malignant tumors and how to reduce their spread and control them and use the best drugs according to the location of the tumor and the type of virus that causes them, vaccines and seropositive are currently and in this particular era one of the best and finest methods of prevention and immunization against diseases of dangerous epidemic viruses, so the science of vaccines took the largest space in the teaching curriculum, including its types and the best methods of production and evaluation. The curriculum is also concerned with studying the various body mechanisms to defend against different nurses and the study of land

Immunology and immune mechanisms of resistance.

9. Course Outcomes and Teaching, Learning and Evaluation Methods

A- Knowledge Objectives.

To enhance the understanding and skills of the students of the Faculty of Pharmacy in the course of Medical Microbiology, emphasis is placed on the following educational objectives:

1. Understand the rules of parasitic infections: Deepen knowledge of the basics and mechanisms of parasitic infections, to provide a solid foundation in understanding parasite-host interactions.

2. Parasite Classification and Diagnosis: Exploring different types and strains of parasites, focusing on how to accurately diagnose them using contemporary techniques.

3. Viral Composition and Classification: The study of the morphological and anatomical structure of viruses and their classification by genome type, to provide a comprehensive understanding of virus diversity and adaptation.

4. Use of antiviral drugs: Identify effective antiviral drugs to eliminate them and prevent the spread of pandemic viruses, emphasizing the importance of responsible use to avoid drug resistance.

5. Viral Disease Control: Develop familiarity with how to control and prevent viral diseases, with an emphasis on preventive strategies.

. Health Awareness and Counseling: Enhancing knowledge about the modes and sources of transmission, and providing health guidance for the prevention of infectious diseases.

7. Following up on health recommendations: Keeping abreast of the latest scientific and medical developments to control epidemic diseases and prevent their spread globally.

8. Seasonal Health Awareness: Advise on the prevention of seasonal diseases that may lead to a global pandemic, focusing on ways to avoid infection.

9. Accurate Diagnosis: Teaching students the proper diagnosis of parasites and viruses that cause malignant tumors using the finest laboratory techniques.

10. Body Resistance to Nurses: Study the mechanisms of body resistance against different nurses, to understand how to develop effective defensive responses.

11. Autoimmune diseases and cancer: Explore autoimmune diseases and cancer immunity to provide an in-depth understanding of immune interactions**.**

B - Course Skills Objectives

1. Understand the basics of parasitic and viral infections: Provide students with in-depth knowledge about the rules of parasitic and viral infections, including infection and host defense mechanisms.

2. Parasite and Virus Classification and Diagnosis: Learn how to identify and diagnose different parasite types and viral strains using the latest technology and methodologies.

3. Morphological and anatomical structure and genomic classification: The study of the morphological and anatomical characteristics of parasites and viruses, and their accurate classification by genome type.

4. Antiparasitic and antiviral treatments: Explore the use of effective drugs against parasites and viruses to eliminate them and prevent the spread of pandemic viruses in particular.

5. Prevention of oncogenic viruses: Acquire knowledge about viruses that cause malignancies and the latest diagnostic and treatment methods to control their spread.

6. Serious epidemic diseases: Deepen understanding about epidemic diseases such as Ebola, SARS, and AIDS, and how to control them and prevent their spread using appropriate treatments and health education.

7. Development and use of vaccines: Studying the process of manufacturing vaccines and using the latest scientific methods to produce effective and safe vaccines at low cost, focusing on the importance of vaccines in reducing the spread of epidemic viral diseases.

8. Understanding Immune Mechanisms: Providing students with the ability to understand different immune mechanisms, which enhances their understanding of how the body protects against nurses and supports healthy responses.

This integrated curriculum ensures that graduates are equipped with the comprehensive knowledge and skills necessary to contribute effectively to the medical and pharmaceutical field, with the ability to deal with current and future health challenges.

Teaching & Learning

1- Lectures on the various means of attendance
2- Group Discussion
3- Workshops and seminars
4- Hospital training
5- Viewing patients' cases
6- Small Group Tasks
7-PowerPoint presentation

Assessment Methods

1- Quizzes
2- Oral exam and direct questions
Midterm exam
final examination

C- Emotional and value objectives

C1- Adhere to the highest standards of ethical and professional conduct in all aspects of therapeutic decision-making and patient care.
C2- Demonstrate commitment to patient safety.
Evidence-based Practice
A4- Respect the patient's autonomy and preferences.
C5- Cooperate effectively with other healthcare professionals.

Teaching & Learning

dzdz Case studies
2- Group Discussions
3- Lectures
4- Hospital training
5- Small Group Tasks
6-Power Point Presentation

Valuation Methods

1-Observing students' interaction with patients
2- Case Based Scenarios

(d) Transferred general andqualifying skills (other skills related to employability and personal development).

To work in medical diagnostic laboratories in government and private hospitals -2 Qualifying the graduate to work in quality control laboratories for pharmaceutical production laboratories
3-Qualifying the graduate to work in pharmaceutical control laboratories 4- Qualifying the graduate to work in laboratories for the production and sterilization of vaccines and serums 5- Qualifying the graduate to work in scientific laboratories in academic institutions

10. Course Structure Viruses					
Week	**Hours**	**Learning outcomes required for the program***	**Module Name/ or Topic**	**teaching method**	**Valuation Method**
1	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Introduction	Throwing Lectures and discussion in presence and data show	Written and oral tests and direct questions
2	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Comparison between viruses and bacteria and other microbes;		
3	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,D1,D2,D3 ,D4,D5	Classification of viruses		
4	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	Replication		
5	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Chemotherapy		
6	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Herpes viridae, Orthomyxo viruses, Paramyxo viruses		
7	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	Retro viruses;		
8	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Retro viruses; Hepato viruses		
9	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	**AIDS,SARS,Ebola,La** viruses		
10	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Oncogenic viruses		
Parasite Course Structure					
1	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Introduction to medical parasitology		
2	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**Introduction to protozoa, *Entamoeba histolytica, E. coli, Entamoeba gingivalis,*** *Endolimax nana, Iodomoeba butchlii*		
3	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,D1,D2,D3 ,D4,D5	**A. The flagellates of**		

			digestive tract and genital organs: ***Giardia lamblia, Trichomonas vaginalis, Trichomonas tenax, Trichomonas hominis.*** **Ciliates:** Balantidium coli		
4	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	B. Blood & tissue flagellates: *Leishmania* spp. and *Trypanosome* spp.		
5	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**Sporozoa: A. Malaria parasite** Plasmodium spp.		
6	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	**B. Toxoplasmosis** Toxoplasma gondii		
7	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	Helminths: Introduction and Classification, Trematoda: Blood flukes or Schistosomes		
8	2	A1 , A2 , A3, B1, B2,B3 ,C1	**Cestoda: A. Adult tapeworm Infections:** ***Taenia saginata,*** *Taenia solium, Hymenolepis nana*		
9	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	***Nematodes: Introduction to Nematodes:*** Ascaris lumbricoides,		
10	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Ancylostoma duodenale, Enterobius		

			vermicularis		
14	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**General Laboratory Diagnostic Techniques and** Samples, Review before the final exam		
		Immunology Course Structure			
1	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	**General information in immunology**		
2	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**general introduction in immunology(innate and adaptive حصانة**		
3	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	**Antigen characteristi c**		
4	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	**Antibody characteristi c**		
5	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**B and T cells**		
6	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	**26.Complem ent:**		
7	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	**Hypersensiti vity types**		
8	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	**Oncogenic immunity**		
9	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**Autoimmun e disease**		
10	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Hypersensitive		
11	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	**Immune deficiency diseases**		
12	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	**plot id**		
13	2	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**complete Immune deficiency**		

			diseases		

The weekly course schedule for the Medical Microbiology I course allocated to the Faculty of Pharmacy , which determines the distribution of weekly hours, the desired educational results (ILOs), the titles of units/modules or topics, teaching methods, and evaluation methods over a semester:

Week	Hours	Learning outcome	Module/Module Title or Topic	Teaching Methods	Assessment methods
1	3	Understand the scope of microbiology and its importance to pharmacy.	Introduction to Medical Microbiology	Lecture, PowerPoint Presentations	Multiple Choice Examination Questions
2	3	Determine the structure and function of bacterial cells.	Bacterial cell Structure	Interactive Lecture	Short Answer
3	3	Identify different types of microorganisms including bacteria, viruses, fungi, and parasites.		Lecture, practical sessions using microscopes	Multiple Choice Examination Questions
4	3	Exploring microbial genes and molecular biology.	Microbial Genes	Group Discussion, Case Studies	Written assignment oral presentation
5	3	Understand the mechanisms of microbial virulence.	Mechanisms of microbial virulence	Laboratory practical training, practical sessions	Laboratory Reports, Practical Examination
6	3	Discuss the principles of immunity and the mechanisms of the breadwinner's defense.	Immunity Fundamentals	Seminar, student presentations	Bid Evaluation, Multiple Choice Questions
7	3	Analyze the principles of microbial culture, growth, and control.	Cultivation and Growth of Microbes	Interactive lecture, group activities	Quiz, Peer Review

8	3	Understand the mechanisms of antibiotics and antimicrobial resistance.	Antibiotics	Lecture, practical sessions	Practical Exam, Short Answer Questions
9	3	Examine the role of microorganisms in human disease and public health.	Microorganisms in Human Diseases	Case Studies, Lab Presentation	Written Assignment, Lab Reports
10	3	Study of special bacterial pathogens and their diseases.	Bacterial pathogens and diseases	Seminar, Guest Lecture	Quiz, Written Assignment
11	3	Exploring viral infections and their impact on human health.	Viral infection	Group Discussion, Problem Based Learning	Case study analysis, multiple choice questions
12	3	Investigation of fungal and parasitic diseases.	Fungal and parasitic diseases	Laboratory practical training, practical sessions	Practical Skills Test, Peer Review
13	3	Review of microbial diagnostic techniques and laboratory techniques.	Microbial Diagnostic Techniques	Interactive lecture, group discussion	Oral Exam, Comprehensive Exam
14	3	Prepare for final evaluations through a thorough review.	Retrospective	Review Lectures, Q&A Sessions	-
15	-	-	Final Exams	-	Final Exams

Table 1.

11. Infrastructure

Required textbooks	Medical Microbiology, tweentyeightedition E .Jawetz, J.L. Melnick, E.A. Adel 2019 Medical Virology Thrirteen edition By Phillip Rose 2012 HumanParasitology, 4th edition, Burton J.

	BOGITSH, Clint E. Carter, Thomas N. Oeltmann. 2013 Medical Virology Thrirteen edition By Phillip Rose 2012
Main References	1. Barbara G.Wells & Joseph T. Diriro, Pharmacotherapy handbook 11th Edittion. 2-Chisholm-Burns, Marie A., Patrick M. Malone, Terry L. Schwinghammer, Jill M. Kolesar, Barbara G. Wells, and Joseph T. DiPiro. Pharmacotherapy principles & practice. 6th edition. 3. Pharmacotherapy casebook: a patient focused approach, McGraw Hill(4-Roger Walker, Clive Edwards (eds), Clinical Pharmacy & Therapeutics 6thedition.
ز) **Recommended books and references (scientific journals,reports ,.....)**	Journal of Clinical pharmacy and therapeutics International journal of clinical pharmacy
س) **Electronic references, websites ,.....**	© 2018 UpToDate. Lexicomp

12. Course Development Plan
N/A

To understand the application of quantitative and theoretical principles of the physical 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 development of new drugs and dosage forms

1. Educational institution	Alayen Iraqi University - College of Pharmacy
2. College department/Center	pharmaceutics
3. Course title/code	Physical pharmacy 1 PH2103
4. Modes of Attendance offered	Full-time and official attendance hours
5. Semester/Year	First semester 2023-2024
6. Credits (total)	45 hr theory & 30 hr practical/ semester
7. Date of description form preparation//Revision of this specification	1/10/2023

8. Course Objectives

In the theoretical part: to understand and apply quantitative and theoretical principles of different states of matter and ways to benefit from them in the fields of pharmacy. It also helps the pharmacist calculate the solubility, compatibility, and biological activity of drugs. As a result of this knowledge, will help in the development of new drugs and formulations as well as in improving various drug delivery methods.

9. Learning Outcomes, Teaching, Learning, and Assessment Method

a- Cognitive goals

1- Enabling students to identify states of matter.
2- Enabling students to acquire and understand thermodynamics.
3- Enabling students to collect and understand electrolyte and non-electrolyte solutions.
4- Enabling students to obtain and understand ionic balance and puffrates

b- The skills goals special to the course

1. Enabling students to acquire skills in solving mathematical problems related to the course.
2. Enabling students to possess medication storage skills
3. Enabling students to possess the skills to work in laboratories and conduct scientific experiments
4. Enabling students to acquire the skill of writing scientific reports

Teaching and Learning Methods

1- Multimedia lectures
2- Group discussion
3- Workshops and seminars
4- Presentation of cases
5- Power Point presentation

Assessment methods

1. Short tests
2. Oral exam and direct questions
3. Midterm exam
4. Electronic exams on the electronic platform
5. Final exam

c- Affective and value goals

1. Adhere to the highest standards of ethical behavior and professional behavior in all aspects of treatment decision-making and patient care.
2. Demonstrating commitment to patient safety.
3. Evidence-based practice. A4- Respect the patient's autonomy and preferences.
4. Collaborate effectively with other health care professionals

Teaching and Learning Methods

1- Group discussions
2- Lectures
3- Small group tasks
4- Power Point presentation

Assessment methods

1. Homework
2. Role-playing scenarios
3. Electronic exams on the electronic platform

d- General and rehabilitative transferred skills (other skills relevant to employability and personal development)
1. Raising students on humanitarian and professional work. 2. Developing students' sense of responsibility during the period of study and work. 3. Supporting drug culture among students and community members. 4. Enhancing the spirit of cooperation and teamwork among students

10. Theory Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1.	3	A1,B3,C5,D1,D3,D4	Stats of matter: Ionic forces	Lectures Discussion data show	Written and oral exams and direct questions
2.	3	A1,B3,C5,D1,D3,D4	Liquid and solid state		
3.	3	A1,B3,C5,D1,D3,D4	Garsous state		
4.	3	A1,B3,C5,D1,D3,D4	Thermodynamic: First low of thermodynamic		
5.	3	A1,B3,C5,D1,D3,D4	Thermodynamic: Second low of thermodynamic		
6.	3	A1,B3,C5,D1,D3,D4	Thermodynamic: Third low of thermodynamic		
7.	3	A1,B3,C5,D1,D3,D4	Solution of non Electrolyte: Property		
8.	3	A1,B3,C5,D1,D3,D4	Solution of electrolyte: Law and equations		
9.	3	A1,B3,C5,D1,D3,D4	Solution of electrolyte: Property		
10.	3	A1,B3,C5,D1,D3,D4	Solution of electrolyte: Law and equations		
11	3	A1,B3,C5,D1,D3,D4	Ionic equilibrium: Acid-base theory		
12	3	A1,B3,C5,D1,D3,D4	Ionic equilibrium: Equations for different cases		
13	3	A1,B3,C5,D1,D3,D4	Buffer: Type and preparation		
14	3	A1,B3,C5,D1,D3,D4	Buffer: Isotonic solution		
15	3	A1,B3,C5,D1,D3,D4	Buffer: Isotonic solution		

10. Laboratory Course Structure					
Week	**Hrs.**	**ILOs**	**Unit/Module or Topic Title**	**Teaching methods**	**Assessment methods**
1	2	A1,B3,C5,D1,D3,D4	Introduction to physical pharmacy	Lectures Discussion data show	Written and oral exams, semenar and direct questions
2-3	4	A1,B3,C5,D1,D3,D4	Expression of concentrations in pharmaceutical preparation		
4-5	4	A1,B3,C5,D1,D3,D4	Two-component systems containing liquid phases		
6-7	4	A1,B3,C5,D1,D3,D4	Three-component systems		
8-9	4	A1,B3,C5,D1,D3,D4	Tie linear for three-component systems		
10	2	A1,B3,C5,D1,D3,D4	Partition coefficient: Measurements and evaluation		
11-12	4	A1,B3,C5,D1,D3,D4	Solubility methods		
13-14	4	A1,B3,C5,D1,D3,D4	Buffer solution		
15	2	A1,B3,C5,D1,D3,D4	Determination of solubility product constant of slightly soluble salts		

11. Infrastructure	
Books Required reading	Pharmaceutical Dosage forms and drug delivery Edited ByRam I. Mahato, Ajit S. Narang by Taylor & Francis Group, LLC Third Edition
Main references (sources)	1- Martin´s physical pharmacy and pharmaceutical sciences, Patrick J. Sinko . Wolters Kluwer. Lippincott Williams &Wilkins. Philadelphia. 2011. 2- Lab manual for physical pharmacy adopted by the department
Recommended books and references (scientific journals, reports…).	
Electronic references, Internet sites…	

12. Course development plan
Not available

To understand the application of quantitative and theoretical principles of the physical 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 development of new drugs and dosage forms

1. Educational institution	Alayen Iraqi University - College of Pharmacy
2. College department/Center	pharmaceutics
3. Course title/code	Physical pharmacy 2 PH2203
4. Modes of Attendance offered	Full-time and official attendance hours
5. Semester/Year	Second semester 2023-2024
6. Credits (total)	45 hr theory & 30 hr practical/ semester
7. Date of description form preparation//Revision of this specification	1/10/2023

8. Course Objectives

In the theoretical part: to understand and apply quantitative and theoretical principles of different states of matter and ways to benefit from them in the fields of pharmacy. It also helps the pharmacist calculate the solubility, compatibility, and biological activity of drugs. As a result of this knowledge, will help in the development of new drugs and formulations as well as in improving various drug delivery methods.

9. Learning Outcomes, Teaching, Learning, and Assessment Method

a- Cognitive goals

1. Enabling students to achieve and understand the degree of solubility and the phenomenon of distribution.
2. Enabling students to obtain and understand the degree of reactions and the effect of temperature and other factors on the speed of the reaction.
3. Enable students to achieve the degree of viscosity of fluids and rheology.
4. Enable students to achieve and understand the properties of surfaces and colloidal solutions

b- The skills goals special to the course

1- Enabling students to acquire skills in solving mathematical problems related to the course.
2- Enabling students to possess medication storage skills
3- Enabling students to possess the skills to work in laboratories and conduct scientific experiments
4- Enabling students to acquire the skill of writing scientific reports

Teaching and Learning Methods

1- Multimedia lectures
2- Group discussion
3- Workshops and seminars
4- Small group tasks
5- Power Point presentation

Assessment methods

1- Short tests
2- Oral exam and direct questions
3- Midterm exam
4- Electronic exams on the electronic platform
5- Final exam

c- effective and value goals

1- Promoting awareness of the importance of empathy and understanding in providing pharmaceutical care and dealing with patients humanely.
2- Promote pharmaceutical ethical values such as honesty, integrity, respect, and fairness in the pharmacist's interactions with patients and other medical teams.
3- Encouraging evidence-based values and critical thinking in pharmaceutical decision-making based on scientific research and clinical information.
4- Enhancing awareness of the importance of the pharmacist's social and professional responsibility in providing quality and safe health care.
5- Promoting awareness of the importance of maintaining patients' privacy and confidentiality of their health information and the legal obligations related to this aspect.

6- Encouraging the development of effective communication capabilities and the ability to collaborate and work within multidisciplinary health care teams.
7- Promoting awareness of the importance of achieving a balance between pharmaceutical work and personal life to maintain emotional and psychological satisfaction

Teaching and Learning Methods

1- Using a strategy of cooperation and assistance during the education process
2- Field visits to relevant ministries and educational institutions
3- Holding seminars, courses, and workshops for students that encourage spiritual values
4- Form a discussion group during the lecture
5- Assigning students tasks that require subjective explanations in causal ways

Assessment methods

1- Discussion in small groups
2- Homework
3- Role-playing scenarios

d- General and rehabilitative transferred skills (other skills relevant to employability and personal development)

1- Using sources from the Internet
2- Conduct a research study

10. Theory Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1.	3	A1,B3,C5,D1,D3,D4	Solubility: Definitions	Lectures Discussion data show	Written and oral exams and direct questions
2.	3	A1,B3,C5,D1,D3,D4	Solubility: Theories		
3.	3	A1,B3,C5,D1,D3,D4	Solubility: Distribution		
4.	3	A1,B3,C5,D1,D3,D4	Kinetics: First, second and thirds		
5.	3	A1,B3,C5,D1,D3,D4	Kinetics: Expiry date		
6.	3	A1,B3,C5,D1,D3,D4	Kinetics: Shelf life		
7.	3	A1,B3,C5,D1,D3,D4	Rheology: Newtonian systems, change in flow		
8.	3	A1,B3,C5,D1,D3,D4	Rheology: Liquefy-negative textures		
9.	3	A1,B3,C5,D1,D3,D4	Rheology: Calculate the change in flow		
10.	3	A1,B3,C5,D1,D3,D4	Surface tension: interfaces, the free energy of the interfaces		
11	3	A1,B3,C5,D1,D3,D4	Surface tension:Measurement of surface tension and diffusion coefficient		
12	3	A1,B3,C5,D1,D3,D4	Surface tension: Surface active elements and hydration phenomena		
13	3	A1,B3,C5,D1,D3,D4	Colloids: Colloidal systems and their pharmaceutical applications		
14	3	A1,B3,C5,D1,D3,D4	Colloids: Types of colloidal solutions, kinetic properties of colloids		
15	3	A1,B3,C5,D1,D3,D4	Colloids: Optical and electrical properties of colloids		

10. Laboratory Course Structure					
Week	**Hrs.**	**ILOs**	**Unit/Module or Topic Title**	**Teaching methods**	**Assessment methods**
1-2	4	A1,B3,C5,D1,D3,D4	Solubility: Solubilization of components of pharmaceutical preparations	Lectures Discussion data show	Written and oral exams and direct questions
3-4	4	A1,B3,C5,D1,D3,D4	Solubility: Solubilization of Aspirin		
5	2	A1,B3,C5,D1,D3,D4	Solubility: Determination of partition coefficient		
6-7	4	A1,B3,C5,D1,D3,D4	Solubility: Surface tension: measurements and calculations		
8-9	4	A1,B3,C5,D1,D3,D4	Kinetic: Rate kinetic: Application in the stability of pharmaceutical stability		
10	2	A1,B3,C5,D1,D3,D4	Review and tutorial		
11-13	6	A1,B3,C5,D1,D3,D4	Viscosity:Viscosity: Measurements and calculation		
14-15	4	A1,B3,C5,D1,D3,D4	Adsorption isotherm		

11. Infrastructure	
Books Required reading	1- Martin´s physical pharmacy and pharmaceutical sciences, Patrick J. Sinko. Wolters Kluwer. Lippincott Williams &Wilkins. Philadelphia. 2011. 2- Lab manual for physical pharmacy adopted by the department
Main references (sources)	Pharmaceutical Dosage forms and drug delivery Edited ByRam I. Mahato, Ajit S. Narang by Taylor & Francis Group, LLC Third Edition
Recommended books and references (scientific journals, reports…).	
Electronic references, Internet sites…	

12. Course development plan
Not available

COURSE SPECIFICATION

This course description provides a necessary summary of the most important characteristics of the course and the learning results expected from the student to achieve, demonstrating whether he has achieved the maximum benefit from the available learning opportunities. It must be linked to the program description.

1. Educational institution	Al-Ayen Iraqi University - College of Pharmacy
2. College department/Center	Pharmacognosy and Supporting Sciences
3. Course title/code	Pharmacognosy I/ Theory/PH2205
4. Modes of Attendance offered	Full-time and official attendance hours
5. Semester/Year	Second semester 2023-2024
6. Credits (total)	2 hr x 15 weeks = 30 hrs
7. Date of description form preparation//Revision of this specification	1/10/2023

8. Course Objectives

Studying the meaning of drugs and medicinal plants - Diagnosing medicinal plants - Phytochemistry - Methods of extraction, isolation and diagnosis of active compounds within the plant.

9. Learning Outcomes, Teaching, Learning and Assessment Method

A. Cognitive goals

A1-Knowledge of botanicals

A 2- Study of medicinal plants and their extraction methods

A3- The possibility of artificially propagating plants to increase the percentage of active substances decision-making process.

B. The skills goals special to the course
B1 - Acquisition of skill in extraction methods B2 - Acquisition of skill in isolating active substances B3 - Acquisition of the skill in diagnosing it
Teaching and Learning Methods
1- Theory lectures 2-Educational laboratories 3-Scientific reports 4-Desk Research
Assessment methods
1- Mid-term and final exams 2.Oral exams and laboratory research 3.Visit the botanical garden 4.Use of scientific equipment
C. Affective and value goals
C1- Presentation of research using the computer C2- Learn about medicinal plants C 3- Using modern laboratory equipment
Teaching and Learning Methods
-Seminars - daily assignments - written exams
Assessment methods
1. Oral and written exams and writing reports on practical experiences
D. General and rehabilitative transferred skills (other skills relevant to employability and personal development)
D 1- Conducting scientific experiments D2- Acquisition of computer skills D 3-Giving confidence to the student by presenting scientific research

10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2, D3	General Introduction: The Scope of Pharmacognosy, Drugs from natural sources, crud drugs, official and non-official drugs.	1- Whiteboard and PowerPoint and data show presentation 2- Class discussion 3- Presentation of cases 4- Handouts 5- Visual aids: Utilize visual aids such as pictures, charts, graphs, diagrams	1- Short MCQs 2- Oral exam and direct questions in the class 3- Midterm exam 4- Electronic exams on the electronic platform 5- Final exam
2	2	A1, A2, A3, B1	Classification of natural products. Plant nomenclature and taxonomy.		
3	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Production of crude drugs: Cultivation, collection, drying and storage.		
4	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2, D3	Deterioration of crude natural products.		
5	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2,	Chemistry of natural drug products.		
6	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2,	Quality control: Evaluation of natural products		
7	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2,	Toxic substances: Food additive and contaminants, Pesticides Phytochemical investigation of herbal products: Extraction of the plant material; Separation and isolation of constituents; characterization of the isolated Compounds.		
8	2	A1, A2, A3, B1, B2, B3, C1, C3, , D1, D2,	Separation technique		
9	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Traditional plant medicines as a source of new drugs.		
10	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2,	Tissue culture of medicinal plant		

11. Infrastructure	
Books Required reading	1-Trease, G.E. and Evans, W.C. "Trease and Evans' Pharmacognosy" WB Saunders Co. Ltd., London, Philadelphia, Toronto, Sydney, Tokyo (1994, 2005). 2-Wallis, T.A. "Textbook in Pharmacognosy" CBS publisher & Distributers, First Indian edition (1985). 3-Mahran, G.H., "Medicinal Plants" 1st Ed.(1967). 4-Saber, A.H., "Practical Pharmacognosy" El-Shaab Printing House, 4th Ed. (1966). 5-Jackson, B.P. and Snowdon D.W., "Atlas of microscopy of medicinal plants, herbs and spices" Belhaven Press, Printer Publishers, London. (1990).
Main references (sources)	1-Indian Pharmacopoeia, Egyptian Pharmacopoeia. 2-De Smet, P.A., Keller, K., Hausel, R. and Chandler, R.F., "Adverse effects of herbal drugs", Springer Verlag, Berlin, Heidelberg, New York, London, Paris, Tokyo, Hong Kong, Vol. I (1993). 3-Weiss R.F. and Fintelmann V. " Herbal Medicine", Thieme, Stuttgart, New York, 2nd Ed. (2000).
Recommended books and references (scientific journals, reports…).	1-Trease, G.E. and Evans, W.C. "Trease and Evans' Pharmacognosy" WB Saunders Co. Ltd., London, Philadelphia, Toronto, Sydney, Tokyo (1994, 2005). 2-Wallis, T.A. "Textbook in Pharmacognosy" CBS publisher & Distributers, First Indian edition (1985).
Electronic references, Internet sites…	Periodicals, Web Sites, …. Etc http://www.botanical.com

12. Course development plan
-Suggesting and discussing new topics -Some of the curriculum vocabulary has been changed in a simple way to keep pace with modern scientific developments -Conducting seminars and seminars within the branch to present modern scientific topics

COURSE SPECIFICATION

This course description provides a necessary summary of the most important characteristics of the course and the learning results expected from the student to achieve, demonstrating whether he has achieved the maximum benefit from the available learning opportunities. It must be linked to the program description.

1. Educational institution	Al-Ayen Iraqi University - College of Pharmacy
2. College department/Center	Pharmacognosy and Supporting Sciences
3. Course title/code	Pharmacognosy I Practical's/ PH2205
4. Modes of Attendance offered	Full-time and official attendance hours
5. Semester/Year	First semester 2023-2024
6. Credits (total)	1 hr x 15 weeks = 15 hrs
7. Date of description form preparation//Revision of this specification	1/10/2023

8. Course Objectives

This course aim to enable students practicing the techniques of extraction, separation, and identification of constituents isolated from natural sources, using microscopes and chromatographic methods.

9. Learning Outcomes, Teaching, Learning and Assessment Method

E. Cognitive goals

A1- Knowledge of botanical preparations

A 2- Study of medicinal plants and their extraction methods

A3- The possibility of artificially propagating plants to increase the percentage of active substances

F. The skills goals special to the course

1-Extraction practice

2-Differentiation of plants

3-Isolation and identification of active components

Teaching and Learning Methods

1- PowerPoint and Multimedia presentation
2- Class discussion
3- Visual aids: Utilize visual aids such as pictures, charts, graphs, diagrams

Assessment methods

-Make periodic reports
-Oral and written exams
- Discussion in class by asking questions that encourage linking the subject with other subjects

G. Affective and value goals

C1- Preparing a successful pharmacist with the ability to work in various health and medical institutions.
C2- Preparing students who are able to complete their studies
C3- work within academic institutions

Teaching and Learning Methods

1- -Emphasis on the necessity of learning and experience in the field of teaching
2- Discussions
3- Lectures
4- Assignments
5- PowerPoint presentation

Assessment methods

2. Surprising inferential questions during the discussion in different aspects of education Homework
3. Electronic MCQs on the electronic platform
4. Mid-term exam
5. Final exam

H. General and rehabilitative transferred skills (other skills relevant to employability and personal development)

D1-Discussing different disease states and finding appropriate treatments for them.
D2- Asking brainstorming questions through which the student can link the study
D3- Materials together and link them to the health reality

10. Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1.	1	A1, A2, A3, B1	Familiarity with the contents of the lecture through understanding and assimilation of the vocabulary of the lecture	1- Whiteboard and PowerPoint and data show presentation 2- Class discussion 3- Presentation of cases 4- Handouts 5- Visual aids: Utilize visual aids such as pictures, charts, graphs, diagrams	1- Short MCQs 2- Oral exam and direct questions in the class 3- Midterm exam 4- Electronic exams on the electronic platform 5- Final exam
2.	1	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Chromatography.		
3.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Paper chromatography (circular and horizontal paper)		
4.	1	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Introduction to tin-layer chromatography		
5.	1	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Thin-layer chromatography		
6.	1	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	TLC on microscope slides.		
7.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Effect of activity of adsorbents on Rf values		
8.	1	A1, A2, A3, B1, B2, B3, C1, C2, C3, D1, D2	Effect of activity of mobile phase on Rf values		
9.	1	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Partition chromatography		
10.	1	A1, A2, A3, B1, B2, B3, C1, C2, C3, D1, D2	Revision for exams		

11. Infrastructure	
Books Required reading	1-Trease, G.E. and Evans, W.C. "Trease and Evans' Pharmacognosy" WB Saunders Co. Ltd., London, Philadelphia, Toronto, Sydney, Tokyo (1994, 2005). 2-Wallis, T.A. "Textbook in Pharmacognosy" CBS publisher & Distributers, First Indian edition (1985). 3-Mahran, G.H., "Medicinal Plants" 1st Ed.(1967). 4-Saber, A.H., "Practical Pharmacognosy" El-Shaab Printing House, 4th Ed. (1966). 5-Jackson, B.P. and Snowdon D.W., "Atlas of microscopy of medicinal plants, herbs and spices" Belhaven Press, Printer Publishers, London. (1990).
Main references (sources)	1-Indian Pharmacopoeia, Egyptian Pharmacopoeia. 2-De Smet, P.A., Keller, K., Hausel, R. and Chandler, R.F., "Adverse effects of herbal drugs", Springer Verlag, Berlin, Heidelberg, New York, London, Paris, Tokyo, Hong Kong, Vol. I (1993). 3-Weiss R.F. and Fintelmann V. " Herbal Medicine", Thieme, Stuttgart, New York, 2nd Ed. (2000).
Recommended books and references (scientific journals, reports…).	1-Trease, G.E. and Evans, W.C. "Trease and Evans' Pharmacognosy" WB Saunders Co. Ltd., London, Philadelphia, Toronto, Sydney, Tokyo (1994, 2005). 2-Wallis, T.A. "Textbook in Pharmacognosy" CBS publisher & Distributers, First Indian edition (1985).
Electronic references, Internet sites…	Periodicals, Web Sites, …. Etc http://www.botanical.com

12. Course development plan
-Suggesting and discussing new topics -Some of the curriculum vocabulary has been changed in a simple way to keep pace with modern scientific developments -Conducting seminars and seminars within the branch to present modern scientific topics -Establishing a consultant pharmacy within the collage for students training during the first semester.

COURSE SPECIFICATION

This course description provides a necessary summary of the most important characteristics of the course and the learning results expected from the student to achieve, demonstrating whether he has achieved the maximum benefit from the available learning opportunities. It must be linked to the program description.

1. Educational institution	Alayen Iraqi University - College of Pharmacy
2. College department/Center	Pharmacology & Toxicology
3. Course title/code	Physiology\ PH2104 PhysiologyII\ PH2204
4. Modes of Attendance offered	Full-time and official attendance hours
5. Semester/Year	First and Second semester 2023-2024
6. Credits (total)	2 hr x 15 weeks = 30 hrs
7. Date of description form preparation//Revision of this specification	1/10/2023

8. Course Objectives

1. To study the functions of different body organs.

9. Learning Outcomes, Teaching, Learning and Assessment Method

A. Cognitive goals

1. To study the functions of different body organs.

B. The skills goals special to the course

1. Laboratory experimentations
2. Enable the students to acquire the skills of dialogue, discussion, listening to others and respecting their opinions.

Teaching and Learning Methods

1- PowerPoint and Multimedia presentation
2- Labs
3- Visual aids: Utilize visual aids such as pictures, charts, graphs, diagrams

Assessment methods

1- Short MCQs
2- Oral exam and direct questions in the class
3- Midterm exam
4- Electronic exams on the electronic platform
5- Final exam

C. Affective and value goals

1- Raising self-confidence of the students through learning
2- Increase the student faith by providing a service to the community in the future

Teaching and Learning Methods

1- Discussions
2- Lectures
3- Labs
4- PowerPoint presentation

Assessment methods

1. Summer activities
2. Electronic MCQs on the electronic platform
3. Mid-term exam
4. Final exam

D. General and rehabilitative transferred skills (other skills relevant to employability and personal development)

1. Presentation of researches in conferences.
2. Developing students' sense of responsibility during the period of study and work.
3. Graduates project
4. Enhancing the spirit of cooperation and teamwork among students.

10. Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1.	2	A3,A4,B2,B3,B4,C1,C4, D5	Information about the cell composition	1- Whiteboard and PowerPoint and data show presentation 2- Class discussion 3- Visual aids: Utilize visual aids such as pictures, charts, graphs, diagrams	1- Short MCQs 2- Oral exam and direct questions in the class 3- Midterm exam 4- Electronic exams on the electronic platform 5- Final exam
2.	2	A3,A4,B2,B3,B4,C1,C4, D5	Body cells and cell membrane, ion channels		
3.	2	A3,A4,B2,B3,B4,C1,C4, D5	Properties of mixed nerves, glia, neurotrophins		
4.	2	A3,A4,B2,B3,B4,C1,C4, D5	Nerve functions, graded potentials, action potential		
5.	2	A3,A4,B2,B3,B4,C1,C4, D5	Smooth muscle, cardiac muscle		
6.	2	A3,A4,B2,B3,B4,C1,C4, D5	Alert behavior, sleep and electrical activity of the brain, control of posture and movement		
7.	2	A3,A4,B2,B3,B4,C1,C4, D5	Autonomic nervous system		
8.	2	A3,A4,B2,B3,B4,C1,C4, D5	Surfactants, differences in ventilation and blood flow in different parts of the lung		
9.	2	A3,A4,B2,B3,B4,C1,C4, D5	Gas transport between the lungs and tissue		
10.	2	A3,A4,B2,B3,B4,C1,C4, D5	Respiratory adjustment in health and disease, hypoxia, emphysema, asthma		
11	2	A3,A4,B2,B3,B4,C1,C4, D5	Glomerular filtration rate: measurements, factor affecting GFR		
12	2	A3,A4,B2,B3,B4,C1,C4, D5	The counter current mechanism, role of urea, water diuresis and osmotic dieresis		
13	2	A3,A4,B2,B3,B4,C1,C4, D5	Bicarbonate execration, regulation of Na,K and CL excretion, uremia, acidosis, micturition		

14	2	A3,A4,B2,B3,B4,C1,C4, D5	The electrogardiogram, cardiac arrhythmias		
15	2	A3,A4,B2,B3,B4,C1,C4, D5	Cardiac output		
16	2	A3,A4,B2,B3,B4,C1,C4, D5	Coronary circulation, hypertension, heart failure, angina pectoris		
17	2	A3,A4,B2,B3,B4,C1,C4, D5	Absorption of water and electrolytes, vitamins and minerals		
18	2	A3,A4,B2,B3,B4,C1,C4, D5	Mouth and esophagus		
19	2	A3,A4,B2,B3,B4,C1,C4, D5	Liver and biliary system , small intestine and colon		
20	2	A3,A4,B2,B3,B4,C1,C4, D5	Circulatory body fluid: introduction, blood, bone marrow		
21	2	A3,A4,B2,B3,B4,C1,C4, D5	Immunity		
22	2	A3,A4,B2,B3,B4,C1,C4, D5	Blood group and Rh factor		
23	2	A3,A4,B2,B3,B4,C1,C4, D5	Blood coagulation		
24	2	A3,A4,B2,B3,B4,C1,C4, D5	Abnormalities of hemostasis		
25	2	A3,A4,B2,B3,B4,C1,C4, D5	Metabolism and nutrition		
26	2	A3,A4,B2,B3,B4,C1,C4, D5	Indocrine function		
27	2	A3,A4,B2,B3,B4,C1,C4, D5	Development\function of reproductive system		
28	2	A3,A4,B2,B3,B4,C1,C4, D5	Adrenal functions		
29	2	A3,A4,B2,B3,B4,C1,C4, D5	Physiology of the bone		
30	2	A3,A4,B2,B3,B4,C1,C4, D5	Regulation of carbohydrate metabolism		

11. Infrastructure	
Books Required reading	Guyton and Hall Textbook of Medical Physiology Ganong's Review of Medical Physiology
Main references (sources)	
Recommended books and references (scientific journals, reports…).	
Electronic references, Internet sites…	