COURSE SPECIFICATION

The course will provide an overview of ethical issues facing practicing pharmacists in order to enable the student to understand the basic concepts of ethics, which formulate the relationship of a pharmacist with the patient, colleagues, and other health personnel in order to deliver his pharmaceutical services in a good way. The course will begin with an introduction to ethics in pharmaceutical practice and then proceed to examine in-depth specific topics (Beneficence, Autonomy, Confidentiality, Consent…).

1. Educational institution	Al-Ayen Iraqi University - College of Pharmacy
2. College department/Center	Clinical pharmacy
3. Course title/code	Pharmacy ethics/PH3206
4. Modes of Attendance offered	Full-time and official attendance hours
5. Semester/Year	Second 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

1. Enabling the student to understand the basic concepts of ethics, which formulate the pharmacist's relationship with the patient, colleagues, and other health workers in order to provide his pharmaceutical services in a good manner.

2. To enable the student to explain the ethical principles of autonomy, non-maleficence, beneficence, justice, fidelity, confidentiality, honesty and accountability as they relate to the practice of pharmacy.

3. To enable the student to understand the importance of each ethical principle in guiding professional behavior and decision-making in pharmacy settings.

4. To enable the student to identify real-world scenarios where these ethical principles can come into play and apply them appropriately to resolve ethical dilemmas in pharmacy

practice.

5. To enable the student to demonstrate ethical thinking skills by analyzing case studies and formulating ethical solutions that support the principles of autonomy, non-maleficence, benevolence, justice, sincerity, confidentiality, honesty and accountability in the context of pharmacy practice.

9. Learning Outcomes, Teaching, Learning and Assessment Method

A. Cognitive goals

1. To be able to analyze basic ethical concepts such as honesty, justice, sincerity, etc., and explain how to apply them in the pharmacist's relationship with the patient and colleagues.
2. Applied case studies to illustrate how these concepts are applied in the context of pharmacy.
3. Be able to analyze each ethical principle separately and explain its relevance to the practice of pharmacy.
4. To be able to understand the impact of each principle on the pharmacist's behavior and the decision-making process.

B. The skills goals special to the course

1. Be able to analyze the ethical consequences of pharmacy decisions and explain how professional behavior is guided by ethical principles.
2. To be able to analyze real scenarios facing pharmacists and determine how ethical principles can be applied to solve problems.
3. Be able to make ethical decisions in the context of pharmacy.
4. To be able to analyze specific case studies to understand the ethical challenges related to pharmacy.
5. To be able to develop ethical solutions that support ethical principles related to pharmacy such as autonomy, justice, and confidentiality.

Teaching and Learning Methods

1- PowerPoint and Multimedia presentation
2- Class discussion
3- Presentation of cases of ethical dilemmas
4- Handouts
5- 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- Adhere to the highest standards of ethical and professional behavior in all aspects of treatment decision-making and patient care.

2- Demonstrating commitment to patient safety.
3- Evidence-based practice.
4- Respect the patient's autonomy and preferences.
5- Collaborate effectively with other healthcare professionals for the best interest of the patient.
6. Teaching the students to respect human dignity and freedom to make decisions.
7. Raising students on ethical and professional work.
8. Promoting and consolidating professional and ethical values among students practicing the profession of pharmacy practice.

Teaching and Learning Methods

1- Case studies
2- Discussions
3- Lectures
4- Training and interaction in the hospital and community pharmacy
5- Assignments
6- PowerPoint presentation

Assessment methods

1. Observing students' interaction with patients
2. Case-based scenarios
3. Homework
4. Electronic MCQs on the electronic platform
5. Mid-term exam
6. Final exam

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

1. Raising students on ethical and professional work.
2. Developing students' sense of responsibility during the period of study and work.
3. Supporting medication and pharmacy practice culture among students and community members.
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	1	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Introduction to Pharmacy Ethics (Theoretical considerations).	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	Code of Ethics for Pharmacists		
3/5/4	3	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Common Ethical Considerations in Pharmaceutical Care Practice (Beneficence, Autonomy, Honesty, Informed Consent, Confidentiality, Fidelity …).		
6/7	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C7, D1, D2, D4, D5	Interprofessional Relations.		
8	1	A1, A2, A3, B1, B2, B3, C1, C3, C4, C7, D1, D2, D4, D5	Making ethical decisions.		
9	1	A1, A2, A3, B1, B2, B3, C1, C3, C4, C7, D1, D2, D4, D5	Ethical issues related to clinical pharmacy research.		
10	1	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5, C6, C7, C8, D1, D2, D4, D5	Ethical problems in the pharmacist's clinical practice.		
11	1	A1, A2, A3, B1, B2, B3, C1, C3, C4, C7, D1, D2, D4, D5	Preventing misuse of medicines.		
/13/12 14	3	A1, A2, A3, B1, B2, B3, C1, C3, C4, C7, D1, D2, D4, D5	Case studies in pharmacy ethics. 3		

11. Infrastructure	
Books Required reading	1-Robert J. Cipolle, Linda M. Strand, Peter C. Morley. Pharmaceutical Care Practice: The Clinician's Guide, 3nd Edition. 2- Robert m. Veatch and Amy Haddad. Case Studies in Pharmacy Ethics. Third edition. Copyright © 2008 by Oxford University Press, Inc
Main references (sources)	1-Robert J. Cipolle, Linda M. Strand, Peter C. Morley. Pharmaceutical Care Practice: The Clinician's Guide, 3nd Edition. 2- Robert m. Veatch and Amy Haddad. Case Studies in Pharmacy Ethics. Third edition. Copyright © 2008 by Oxford University Press, Inc
Recommended books and references (scientific journals, reports…).	
Electronic references, Internet sites…	**Internet**

12. Course development plan
Not available

COURSE SPECIFICATION

This course describes the understanding of the biological activity inherent in chemical structures is paramount in drug research. This involves comprehensive analysis of functional groups present in drugs and their correlation with biological effects. Familiarity with various drug classes, their preparation, and identification methods is essential for effective pharmacological investigation. Additionally, strategies to mitigate potential side effects during drug study are crucial for optimizing therapeutic outcomes and safety profiles.

1. Educational institution	Alayen Iraqi University - College of Pharmacy
2. College department/Center	Pharmaceutical chemistry
3. Course title/code	Inorganic Pharmaceutical Chemistry **PH3101**
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- - know the biological activity , if present in chemical structure

2-study all the functional groups for the drugs

3- study the relationship between functional groups and biological activity

4-know some of drug classes including preparation and identification

5-explain how to avoid the side effects of drugs during the study

9. Learning Outcomes, Teaching, Learning and Assessment Method

A-Cognitive goals

1- How to deal with chemical compounds
2- How to deal with scientific equipment
3- Learning using different scientific techniques
4- Knowing the methods used in preparing medicines

B-The skills goals special to the course

1- Acquisition of skill in preparing compounds and medicines
2- Acquisition of skill in the use of different methods in the manufacture and preparation of medicines
3- Acquisition of skill in how to deal with chemical compounds
4- Acquisition of skill in writing scientific reports

Teaching and Learning Methods

Seminars - daily assignments - written exams

Assessment methods

Oral and written exams - scientific reports

C-Affective and value goals

C 1- Students will review the topics discussed in the part.
C 2- Asking questions that students are asked to solve during the classes in the section
C 3- Organizing quick intellectual exams for students in the section.
C 4- Respect and respect the opinions of colleagues while discussing topics.

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)

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. Theory 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	Atomic and molecular structure/complications	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 platform 4- Final exam
2.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Atomic and molecular structure/complications		
3.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Atomic and molecular structure/complications		
4	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Atomic and molecular structure/complications		
5.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Gastrointestinal agents: Fluoride, bromide, lithium, gold, silver and mercury		
6.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Antacid		
7.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Protective adsorbents.		
8.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Topical agents		
9.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Dental agents I		
10.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Dental agents II		
11.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Radiopharmaceutica l preparations I		
12.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Radiopharmaceutica l preparations II		
13	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Radio opaque and contrast media I.		
14	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Radio opaque and contrast media II		
15		1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D			

10. Laboratory Course Structure					
Week	**Hrs.**	**ILOs**	**Unit/Module or Topic Title**	**Teaching methods**	**Assessment methods**
1-2	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Preparation and standardization of 0.1N KMnO4 (known sample, quiz and unknown).	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
3-4	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Assay of NaOH solution (unknown sample + known)		
5-6	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Assay of hydrogen peroxide solution (known sample , quiz and unknown)		
7	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Assay of ferrous sulfate (known sample And unknown sample).		
8-9	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Preparation and standardization of 0.1Na2S2O4 solution (known, quiz and unknown sample).		
10-11	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Assay of copper sulfate (known sample, unknown sample).		
12-13	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Assay of Chlorinated Lime (known sample, quiz and unknown).		
14-15	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Preparation and assay of Lugol's Solution (known sample, quiz and unknown).		

11. Infrastructure	
Books Required reading	Inorganic Medicinal and Pharmaceutical Chemistry by Block, Roche Soine and Wilson, latest edition Wilson and Gisvold; Textbook of Organic medicinal and Pharmaceutical chemistry; Delgado JN, Remers WA, (eds); latest edition
Main references (sources)	Inorganic Medicinal and Pharmaceutical Chemistry by Block, Roche Soine and Wilson, latest edition Wilson and Gisvold; Textbook of Organic medicinal and Pharmaceutical chemistry; Delgado JN, Remers WA, (eds); latest edition
Recommended books and references (scientific journals,	**Scientific journals**

reports…).	
Electronic references, Internet sites…	**Websites of Universities**

12-Course development plan

Course planning is organized in two phases; The first includes writing course specifications, while the second aims to prepare the course plan as a basis for leading the educational process with its implementation and evaluation aspects. Planning is done with the aim of achieving effective communication between students and faculty members. This helps students assess their readiness for the course, allows them to self-adjust their learning, and monitor their progress in the course. The plan also provides a basis for students to evaluate the course and understand how much they will benefit from it.

COURSE SPECIFICATION

The Organic Pharmaceutical Chemistry course provides the study of organic structures and chemical reactions related to pharmaceutical compounds. The course includes the analysis of organic molecules and biological functional groups of drugs, in addition to studying the relationship between chemical structure and biological activity. The course also focuses on introducing students to the different classes of drugs, and their preparation and identification processes. The curriculum includes methods of preventing side effects of medications during study and how to deal with them effectively.

1. Educational institution	Al-ayen Iraqi University - College of Pharmacy
2. College department/Center	Pharmaceutical chemistry
3. Course title/code	Organic pharmaceutical chemistry I **PH3201**
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- Understanding the scientific foundations and basic concepts of organic chemistry and their application to pharmaceutical compounds.

2- Explaining the importance of studying the chemical reactions of organic compounds in designing and developing drugs.

3- Introducing students to biological functional groups and analyzing their impact on the biological activity of drugs.

4- Providing students with the knowledge necessary to understand the manufacture, analysis and identification of drugs in various therapeutic boxes.

5- Explaining methods of preventing potential side effects of medications and applying

9. Learning Outcomes, Teaching, Learning and Assessment Method

A-Cognitive goals

A1- How to deal with chemical compounds
A2- Learning using different scientific techniques
A3- Knowing the factors that affect the stability, solubility and absorption of drugs
A4- Knowing the mechanism of action of the drug and the relationship of the chemical structure to that

B-The skills goals special to the course

B1- Acquisition of skill in preparing compounds and medicines
B2- Acquire skill in using different methods in manufacturing and preparing medicines
B3- acquiring the skill in how to deal with chemical compounds
B4- Gaining the skill in writing scientific reports

Teaching and Learning Methods

Seminars - daily assignments - written exams

Assessment methods

Oral and written exams - scientific reports

C-Affective and value goals

C1- Knowing the methods of designing drugs and chemical compounds
C2- Knowledge of methods of laboratory synthesis of drugs and chemical compounds
C3- Learn the methods of laboratory analysis to know the composition of chemical compounds
C4- Preparing various medicines

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)

D1- Conducting scientific experiments
D2- Acquisition of skill in preparing medicines
D3- Giving confidence to the student by presenting scientific research
D4- Acquiring the skill to detect and classify drugs

strategies to improve drug safety and effectiveness.

10. Theory Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Drug distribution.	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.	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Acid- base properties.		
3.	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Statistical prediction of pharmacological activity.		
4	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	QSAR models.		
5.	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Molecular modeling (Computer aided drug design.)		
6	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Drug receptor interaction: force involved.		
7	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Steric features of drugs.		
8	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Optical isomerism and biological activity.Calculated conformation.		
9	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Three- dimensional quantitative structure activity relationships and databases.		
10	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Isosterism .Drugreceptor interaction and subsequent		
11	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Drug Metabolism-I		
12	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Drug Metabolism-II		
13	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Drug Metabolism-III		
14	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Drug Metabolism-IV		
15	3	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Factor affecting on Drug Metabolism-		

10. Laboratory Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1-2	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Preparation and standardization of 1N HCl (known sample, quiz and unknown).	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
3-4	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Preparation and standardization of 1N 1NaOH (known sample, quiz and unknown).		
5-6	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Assay of sodium benzoate (known sample quiz and unknown).		
7-8.	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Assay of Borax (explanation of basic concepts, quiz and unknown)		
9-10.	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Assay of citric acid (known sample, (unknown sample).		
11-12	4	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Assay of magnesium hydroxide (known sample (quiz and unknown)		
13.	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Assay of ammoniated mercury (unknown sample).		
14	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Solubilization of components of pharmaceutical preparations : Aspirin		
15	2	1A,2A,3A,4A,1B,2B,3B,4B,1C,2C,3C,4C,1D,2D,3D,4D	Surface tension measurements and calculations		

11. Infrastructure	
Books Required reading	Wilson and Gisvold Textbook of Organic medicinal and Pharmaceutical chemistry, Delgado JN, Remers WA, (Eds); 12th ed, 2011.
Main references (sources)	Wilson and Gisvold Textbook of Organic medicinal and Pharmaceutical chemistry, Delgado JN, Remers WA, (Eds); 12th ed, 2011.
Recommended books and references (scientific journals, reports…).	**Scientific journals in basic specializations**
Electronic references, Internet sites…	**Websites of Arab and foreign universities and pharmaceutical companies**

12. Course development plan
Course planning is organized in two phases; The first includes writing course specifications, while the second aims to prepare the course plan as a basis for leading the educational process with its implementation and evaluation aspects. Planning is done with the aim of achieving effective communication between students and faculty members. This helps students assess their readiness for the course, allows them to self-adjust their learning, and monitor their progress in the course. The plan also provides a basis for students to evaluate the course and understand how much they will benefit from it.

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	Clinical pharmacy
3. Course title/code	Biochemistry 1-PH3104
4. Modes of Attendance offered	Full-time and official attendance hours
5. Semester/Year	First semester / Third Year
6. Credits (total)	45 h Theory + 30 h Lab
7. Date of description form preparation//Revision of this specification	1/10/2023

8. Course Objectives

1. Helping to understand the principles of biochemistry.
2. Providing a solid foundation for a successful chemical career.
3. Providing the student with some basic and necessary skills for future studies, such as analyzing results and documents and using the Internet.
4. Enabling the student to prepare seminars related to advanced chemistry topics.

9. Learning Outcomes, Teaching, Learning and Assessment Method

A. Cognitive goals

1. Presenting the concepts of selected topics in biochemistry research.
2. Theoretical application to practical experiments and measurement rules in biochemistry.
3. Statement of basic knowledge and principles in biochemistry.
4. To be able to understand the impact of each principle on the pharmacist's behavior and the decision-making process.

B. The skills goals special to the course

1. Preparing students' research projects.
2. Operational reports.
3. Holding conferences and workshops and participating in scientific discussions.

Teaching and Learning Methods

1- PowerPoint and Multimedia presentation
2- Class discussion
3- Discussing group work in the laboratory.
4- Use scientific references.
5- 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 students on professional humanitarian work.
2- Promoting and consolidating professional and ethical values among students practicing the profession of pharmacist.
3- Enhancing the spirit of cooperation and teamwork among students.
4- Training students to respect the freedom of thought, expression, and creativity of others.
5- Developing students' sense of responsibility during the study period and during work.
6- Raising students to respect human dignity and freedom to make decisions.
7- Raising students in a culture of integrity and fighting corruption in all its forms.
8- Training students to respect the rights of patients regardless of their profession, culture, religion, gender, and custom.

Teaching and Learning Methods

1- Discussing group work.
2- Writing self-reports.
3- Using a strategy of cooperation and assistance during the education process.
4- Field visits to relevant ministries and educational institutions.

Assessment methods

1. Surprising, inferential questions during discussion of various aspects of education.
2. Homework.
3. Electronic exams on the electronic platform.

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

1- Developing the student's ability to deal with multiple learning methods.
2- Follow up on external sources.
3- Follow up on modern scientific topics via the Internet.
4- Trying to solve external questions and homework by referring to modern sources and the Internet.

10. Course Structure :Theory					
Week	**Hrs.**	**ILOs**	**Unit/Module or Topic Title**	**Teaching methods**	**Assessment methods**
1.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Introduction to macromolecule biochemistry	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- Electronic exams on the electronic platform 5- Final exam
2.	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Amino acid biochemistry		
3.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Peptides biochemistry		
4.	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Protiens structures , classification ,synthesis.		
5.	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Denaturation of proteins		
6.	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Carbohydrate chemistry and classifications		
7.	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Lipids biochemistry ,separation ,identifications		
8.	2	A1, A2, A3, B1, B2, B3, C1, C2, C3, C4, C5 D1, D2, D4, D5	Enzymes structures and mechanism ,classifications ,dynamics		
9.	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Kinetics ,michaelis – menten kinetics		
10.	2	A1, A2, A3, B1, B2, B3, C1, C2, C3, D1, D2	Enzyme inhibition		
11	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Nucleic acid chemistry		
12	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Biological function of DNA		
13	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Biochemistry if extracellular and intracellular communications		
14	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Artificial membrane model		
15	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Biochemistry of endocrine system		

Course Structure: Lab					
Week	**Hrs.**	**ILOs**	**Unit/Module or Topic Title**	**Teaching methods**	**Assessment methods**
1.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Effects of acids on carbohydrate :- (Molish's test , Bial's test ,Seliwanoff's test)	Use of materials and devices in laboratories	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, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Classification of carbohydrate according to reducing properties:- (Benedict's test , Barfoed's test ,Iodine's test)		
3.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Determination of unknown carbohydrate sample		
4.	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Color reaction of proteins :- (Biuret's test)		
5.	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Color reaction of amino acids :- (Ninhydrine's test , Millon's test , Hopkins-cole's test , unoxidized sulfur's test)		
6.	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Proteins properties:- (precipitation of protein , effect of strong acid and alkali , effect of concentration of neutral salts , effect of heat)		
7.	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Determination of unknown amino acid sample		
8.	2	A1, A2, A3, B1, B2, B3, C1, C2, C3, C4, C5 D1, D2, D4, D5	Experiments of lipids :- (Iodine's test , Reaction's test , Copper acetate's test)		
9.	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Experiments for Chloesterol :- (Salkowski's test , LiebermannBurchard's test)		
10.	2	A1, A2, A3, B1, B2, B3, C1, C2, C3, D1, D2	Determination of unknown lipids sample		
11	2	A1, A2, A3, B1, B2, B3, C1, C3, C4, C5 D1, D2, D4, D5	Nucleic acid chemistry		
12	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Biological function of DNA		
13	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Biochemistry if extracellular and intracellular communications		

14	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Artificial membrane model		
15	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Biochemistry of endocrine system		

11. Infrastructure	
Books Required reading	Harper's illustrated Biochemistry
Main references (sources)	
Recommended books and references (scientific journals, reports…).	Lehninger (principles of biochemistry) Stryer (biochemistry) Voet (biochemistry)
Electronic references, Internet sites…	

12. Course development plan
Linking laboratory analyzes with theoretical materials.

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	Clinical pharmacy
3. Course title/code	Pathophysiology -PH3105
4. Modes of Attendance offered	Full-time and official attendance hours
5. Semester/Year	First semester /Third year
6. Credits (total)	45 h Theory + 30 h Lab
7. Date of description form preparation//Revision of this specification	1/10/2023

8. Course Objectives

1. Study of many different diseases that affect the human body.
2. Study of pathophysiology and the occurrence of diseases within the body.
3. Identify the most prominent clinical signs accompanying the occurrence of diseases.
4. Identify diseases that affect organs in all body systems

9. Learning Outcomes, Teaching, Learning and Assessment Method

A. Cognitive goals

1. Identify the mechanism of disease occurrence from the physiological perspective of the human body.
2. Identify the pathological effects during the occurrence of the disease and after recovery from it.
3. Identify the clinical symptoms of the disease.

B. The skills goals special to the course

1. Giving a comprehensive idea about the pathology of diseases that affect the various body systems.
2. Explaining the pathology of the disease and the pathological changes accompanying the disease.
3. Giving an anatomical description of all the internal and external organs of the human body and their relationship to each other

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

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 students on professional humanitarian work.
2. Promoting and consolidating professional and ethical values among students practicing the profession of pharmacist.
3. Enhancing the spirit of cooperation and teamwork among students.
4. Training students to respect the freedom of thought, expression, and creativity of others.
5. Developing students' sense of responsibility during the study period and during work.
6. Raising students on a culture of integrity and fighting corruption in all its forms.

Teaching and Learning Methods

1- Discussing group work.
2- Writing self-reports.
3- Using a strategy of cooperation and assistance during the education process.
4- Field visits to relevant ministries and educational institutions.

Assessment methods

1. Surprising, inferential questions during discussion of various aspects of education.
2. Homework.
3. Electronic exams on the electronic platform.

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

1. Developing the student's ability to deal with multiple learning methods.
2. Follow up on external sources.
3. Follow up on modern scientific topics via the Internet.
4. Trying to solve external questions and homework by referring to modern sources and the Internet..

10. Course Structure: Theory					
Week	**Hrs.**	**ILOs**	**Unit/Module or Topic Title**	**Teaching methods**	**Assessment methods**
1.	2	A1, A2, A3, B1, B2, B3, C1, C2, C4, C5, D1, D2, D4, D5	Introduction to pathophysiology	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, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Cell injury and tissue response; Degeneration; Necrosis.		
3.	2	A1, A2, A3, B1, B2, B3, C1, C2, C4, C5, D1, D2, D4, D5	Inflammation (acute and chronic inflammation)		
4.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Syndrome of inappropriate secretion of ADH; Diabetes insipidus; Metabolic acidosis and alkalosis; Respiratory acidosis and alkalosis.		
5.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	MI; Rheumatic heart disease; Heart failure.		
6.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Emphysema and bronchiectasis; Cystic fibrosis; Pulmonary embolism; Pulmonary hypertension.		
7.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Hypertensive glomerular disease; Pyelonephritis; Drug related nephropathies; Acute renal failure; Chronic renal failure.		
8.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Irritable bowel syndrome. Crohn's disease; Diarrhea; Celiac disease.		
9.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Graves's disease		
10.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Thyrotoxicosis		

11	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Diabetes mellitus and metabolic syndrome.		
12	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Metabolic and rheumatic disorders of skeletal system: Osteoporosis; Osteomalacia and rickets.		
13			Ankylosing spodylitis; Gout; Osteoarthritis syndrome.		
14			Alteration in immune response: Hypersensitivity disorders.		
15			Immunodeficien-cy disorders.		

Course Structure: Lab

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1.	2	A1, A2, A3, B1, B2, B3, C1, C2, C4, C5, D1, D2, D4, D5	Introduction to pathophysiology	Use of materials and devices in laboratories	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, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Cell injury and tissue response; Degeneration; Necrosis.		
3.	2	A1, A2, A3, B1, B2, B3, C1, C2, C4, C5, D1, D2, D4, D5	Inflammation (acute and chronic inflammation)		
4.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Syndrome of inappropriate secretion of ADH; Diabetes insipidus; Metabolic acidosis and alkalosis; Respiratory acidosis and alkalosis.		
5.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	MI; Rheumatic heart disease; Heart failure.		
6.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Emphysema and bronchiectasis; Cystic fibrosis; Pulmonary embolism; Pulmonary hypertension.		
7.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Hypertensive glomerular disease; Pyelonephritis; Drug related		

			nephropathies; Acute renal failure; Chronic renal failure.		
8.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Irritable bowel syndrome. Crohn's disease; Diarrhea; Celiac disease.		
9.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Graves's disease		
10.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Thyrotoxicosis		
11	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Diabetes mellitus and metabolic syndrome.		
12	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Metabolic and rheumatic disorders of skeletal system: Osteoporosis; Osteomalacia and rickets.		
13			Ankylosing spodylitis; Gout; Osteoarthritis syndrome.		
14			Alteration in immune response: Hypersensitivity disorders.		
15			Immunodeficien-cy disorders.		

11. Infrastructure	
Books Required reading	- Essential in Pathophysiology by: Carol Mattson Porth lastEd.
Main references (sources)	Pathophysiology Conale
Recommended books and references (scientific journals, reports…).	
Electronic references, Internet sites…	- Essential in Pathophysiology by: Carol Mattson Porth lastEd.

12. Course development plan
Access to modern curricula in foreign universities.

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	Clinical pharmacy
3. Course title/code	Biochemistry 2 -PH3204
4. Modes of Attendance offered	Full-time and official attendance hours
5. Semester/Year	Second Semester /Third Year
6. Credits (total)	45 h Theory + 30 h Lab
7. Date of description form preparation//Revision of this specification	1/10/2023

8. Course Objectives

1. Helping to understand the principles of biochemistry
2. Providing a solid foundation for a successful chemical career
3. Providing the student with some basic skills that may be necessary for future studies, such as analyzing results and documents and using the Internet.
4. Enabling the student to prepare seminars on advanced biochemistry topics.

9. Learning Outcomes, Teaching, Learning and Assessment Method

E. Cognitive goals

1. Presenting the concepts of selected topics in biochemistry research.
2. Theoretical application to practical experiments and measurement rules in biochemistry.
3. Statement of basic knowledge and principles in biochemistry.

F. The skills goals special to the course

1. Preparing students' research projects.
2. Operational reports.
3. Holding conferences and workshops and participating in scientific discussions

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

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

G. Affective and value goals

1. Raising students on professional humanitarian work.
2. Promoting and consolidating professional and ethical values among students practicing the profession of pharmacist.
3. Enhancing the spirit of cooperation and teamwork among students.
4. Training students to respect the freedom of thought, expression, and creativity of others.
5. Developing students' sense of responsibility during the study period and during work.

Teaching and Learning Methods

1- Discussing group work.
2- Writing self-reports.
3- Using a strategy of cooperation and assistance during the education process.
4- Field visits to relevant ministries and educational institutions.

Assessment methods

1. Surprising, inferential questions during discussion of various aspects of education.
2. Homework.
3. Electronic exams on the electronic platform.

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

1. Communicating ideas regarding biochemistry.
2. Display lectures with drawings and pictures.
3. Use external sources.

10. Course Structure: Theory

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1.	2	A1, A2, A3, B1, B2, B3, C1, C2, C4, C5, D1, D2, D4, D5	Bioenergetics	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, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Biological oxydation		
3.	2	A1, A2, A3, B1, B2, B3, C1, C2, C4, C5, D1, D2, D4, D5	Respiratory Chain		
4.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Over metabolism		
5.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Citric Acid cycle		
6.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	glycolysis		
7.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Metabolism of glycogen		
8.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Gluconeogenesi		
9.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Pentose phosphate path way		
10.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Biosynthesis of fatty acids		
11	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Oxidation of fatty acids		
12	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Metabolism of acyl glycerol		
13		A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Lipid transport and storage		
14		A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Cholesterol synthesis		
15		A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Biosynthesis of amino acids		

Course Structure: Lab					
Week	**Hrs**	**ILOs**	**Unit/Module or Topic Title**	**Teaching methods**	**Assessment methods**
1.	2	A1, A2, A3, B1, B2, B3, C1, C2, C4, C5, D1, D2, D4, D5	Vitamin C	Use of materials and devices in laboratories	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, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Estimation of urea level in the blood		
3.	2	A1, A2, A3, B1, B2, B3, C1, C2, C4, C5, D1, D2, D4, D5	Serum calcium measurement		
4.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Serum total protein		
5.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Estimation of uric level in the blood		
6.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	General urine examination		
7.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Estimation of blood phosphorus		
8.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Irritable bowel syndrome. Crohn's disease; Diarrhea; Celiac disease.		
9.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Graves’s disease		
10.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Thyrotoxicosis		
11	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Diabetes mellitus and metabolic syndrome.		
12	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Metabolic and rheumatic disorders of skeletal system:.		
13		A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Ankylosing spodylitis; Gout; Osteoarthritis syndrome.		
14		A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Alteration in immune response: Hypersensitivity disorders.		
15		A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Immunodeficien-cy disorders.		

11. Infrastructure	
Books Required reading	Harper's illustrated Biochemistry, last edition
Main references (sources)	
Recommended books and references (scientific journals, reports…).	Lehninger (principles of biochemistry), last edition Stryer (biochemistry) Voet (biochemistry)
Electronic references, Internet sites…	

12. Course development plan
1- Linking laboratory analyzes with theoretical materials of matter. 2- Continuous updating of the curriculum prescribed for students

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.

1. Educational institution	Alayen Iraqi University - College of Pharmacy
2. College department/Center	pharmaceutics
3. Course title/code	Pharmaceutical technology1 / PH3103
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

The use of pharmacy technology in pharmacy includes: methods of preparing and detecting different drug forms, calculations of medicinal preparations in addition to identifying the physiochemical properties of pharmaceutical substances and methods of dealing with them

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

A. Cognitive goals

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.

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.
4. Respect the patient's autonomy and preferences.
5. 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. Group discussion
2. Homework
3. Role-playing scenarios

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

D1- Using sources from the Internet

D2 - Conducting 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	Solution and type of Solutions: Differentiation between the solubility of pharmaceutical ingredients and factors affecting their solubility	Lectures Discussion Data show	Written and oral exams and direct questions
2.	3	A1,B3,C5,D1,D3,D4	Solubility and factors Affecting solubility: Differentiation between the solubility of pharmaceutical ingredients and factors affecting their solubility		
3.	3	A1,B3,C5,D1,D3,D4	Official solutions: Identification of official solutions		
4.	3	A1,B3,C5,D1,D3,D4	Differentiation between aqueous solutions: Aqueous solution & Aromatic water		
5.	3	A1,B3,C5,D1,D3,D4	Definition of pharmaceutical syrup dosage form and differentiation between their types: Syrups & sugar-based syrups		
6.	3	A1,B3,C5,D1,D3,D4	Identification of the methods of clarification and the equipment used for clarification		
7.	3	A1,B3,C5,D1,D3,D4	Identification of the constituents of the spirit dosage form and its methods of preparation		
8.	3	A1,B3,C5,D1,D3,D4	Identification of the constituents of elixir dosage form and its methods of preparation		

9.	3	A1,B3,C5,D1,D3,D4	Knowing the methods of extraction		
10.	3	A1,B3,C5,D1,D3,D4	Knowing the methods of maceration		
11	3	A1,B3,C5,D1,D3,D4	Identification of the constituents of Tinctures dosage form and its methods of preparation.		
12	3	A1,B3,C5,D1,D3,D4	Identification of the constituents of fluid extract dosage form and its methods of preparation		
13	3	A1,B3,C5,D1,D3,D4	Knowing the types of colloidal dispersion		
14	3	A1,B3,C5,D1,D3,D4	Knowing the types of Coarse dispersion		
15	3	A1,B3,C5,D1,D3,D4	Suspension: Identification of the constituents of suspension dosage form and its methods of preparation		

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	Solutions (Into body cavity, oral and external use)	Lectures Discussion Data show	Written and oral exams and direct questions
3-5	6	A1,B3,C5,D1,D3,D4	Syrups: Preparation techniques and quality evaluation		
6-7	4	A1,B3,C5,D1,D3,D4	Elixirs: Preparation techniques and quality evaluation		
8-10	6	A1,B3,C5,D1,D3,D4	Spirits: Preparation techniques and quality evaluation		
11-13	6	A1,B3,C5,D1,D3,D4	Suspensions: Preparation techniques and quality evaluation		
14-15	4	A1,B3,C5,D1,D3,D4	Dispersion of oils in inhalations		

11. Infrastructure	
Books Required reading	1-Pharmaceutical dosage forms and drug delivery systems by Haward A. Ansel; 10th edition, 2015.Lippincott Williams & Wilkins, a Wolters Kluwer business 2. Sprowels American pharmacy.
Main references (sources)	Aulton's Pharmaceutics: The Design and Manufacture of Medicines, 3rd ed. Michael E. Aulton (Author) Churchill
Recommended books and references (scientific journals, reports…).	
Electronic references, Internet sites…	

12. Course development plan
Adding new experiments concerning practical works in the laboratory (Formulation of paracetamol suspension from Trigonella foenum mucilage)

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. in addition to define and characterize the possible incompatibilities that may occur

1. Educational institution	Alayen Iraqi University - College of Pharmacy
2. College department/Center	pharmaceutics
3. Course title/code	Pharmaceutical technology 2/ PH3203
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

The use of pharmaceutical technology in pharmacy includes: methods of preparing and detecting different drug forms, calculations of medicinal preparations in addition to identifying the physiochemical properties of pharmaceutical substances and methods of dealing with them

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

A- Cognitive goals

1. Enabling students to get knowledge about different dosage forms.
2. Enabling students to understand the different preparation methods at small scale and pharmacy level.
3. Enabling students to know the basis of dosage form preparation, stability, and storage.
4. Enabling students to identify changes in the physicochemical properties or when incompatibility is present between the ingredients of various dosage forms

B- The skills goals special to the course

1- Enable students to acquire the skills to prepare medicine according to the medical conditions diagnosed by the physician
2. Enabling students to possess the skills of preparing medicinal doses
3. Enable students to possess the skills of proper storage conditions for drug

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- 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.
4- Respect the patient's autonomy and preferences.
5- 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

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

D1- Using sources from the Internet

D2 - Conducting a research study

10. Theory Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1.	3	A1,A6,B1,B3,C2,C4,C5,C6,D1,D3,D4	Emulsions: An introduction to emulsions and their preparation methods	Lectures Discussion Data show	Written and oral exams and direct questions
2.	3	A1,A6,B1,B3,C2,C4,C5,C6,D1,D3,D4	Emulsions: Types of emulsifying agents		
3.	3	A1,A6,B1,B3,C2,C4,C5,C6,D1,D3,D4	Liniments AND Collodions		
4.	3	A1,A6,B1,B3,C2,C4,C5,C6,D1,D3,D4	Suppositories base types		
5.	3	A1,A6,B1,B3,C2,C4,C5,C6,D1,D3,D4	Preparation of Suppositories		
6.	3	A1,A6,B1,B3,C2,C4,C5,C6,D1,D3,D4	Semisolid dosage form: Ointments, creams and pastes		
7.	3	A1,A6,B1,B3,C2,C4,C5,C6, D1,D3,D4	Semisolid dosage form: Types of ointment bases		
8.	3	A1,A6,B1,B3,C2,C4,C5,C6,D1,D3,D4	Properties ophthalmic ointments		
9.	3	A1,A6,B1,B3,C2,C4,C5,C6,D1,D3,D4	Powders and granules: Micronization and measurements of powder particle size		
10.	3	A1,A6,B1,B3,C2,C4,C5,C6,D1,D3,D4	Powders and granules: Bulk and divided powders		
11	3	A1,A6,B1,B3,C2,C4,C5,C6,D1,D3,D4	Advantages and properties of Powders and granules		
12	3	A1,A6,B1,B3,C2,C4,C5,C6,D1,D3,D4	Hard and soft gelatin capsules		
13	3	A1,A6,B1,B3,C2,C4,C5,C6,D1,D3,D4	Capsules: Problems associated with filling of solid powders		
14	3	A1,A6,B1,B3,C2,C4,C5,C6,D1,D3,D4	Incompatibilities: Identification of physical, chemical and therapeutic incompatibilities		

10. Laboratory Course Structure					
Week	**Hrs.**	**ILOs**	**Unit/Module or Topic Title**	**Teaching methods**	**Assessment methods**
1-3	6	A1,A6,B1,B3,C2,C4,C5,C6, D1,D3,D4	Emulsions: Preparation techniques and quality evaluation	Lectures Discussion Data show	Written and oral exams and direct questions
4-6	6	A1,A6,B1,B3,C2,C4,C5,C6,D 1,D3,D4	Suppositories: Preparation techniques and quality evaluation		
7-9	6	A1,A6,B1,B3,C2,C4,C5,C6, D1,D3,D4	Powders: Preparation techniques and quality evaluation		
10-12	6	A1,A6,B1,B3,C2,C4,C5,C6,D 1,D3,D4	Capsules: Preparation techniques and quality evaluation		
13-15	6	A1,A6,B1,B3,C2,C4,C5,C6,D 1,D3,D4	Semisolid dosage forms: Preparation techniques and quality evaluation		

11. Infrastructure	
Books Required reading	1-Pharmaceutical dosage forms and drug delivery systems by Haward A. Ansel; 10th edition, 2015.Lippincott Williams & Wilkins, a Wolters Kluwer business 2. Sprowels American pharmacy.
Main references (sources)	Aulton's Pharmaceutics: The Design and Manufacture of Medicines, 3rd ed. Michael E. Aulton (Author) Churchill
Recommended books and references (scientific journals, reports…).	
Electronic references, Internet sites…	

12. Course development plan
none

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	Pharmacognosy and Supporting Sciences
3. Course title/code	Pharmacognosy II/ Theory/ PH3102
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

1. **In the theoretical part**; this course is intended to study about chemistry of natural products like glycosides, Tannins, Resins', Volatile oils etc. This course included Pharmacology and chemistry with chemical structure.
2. **In the Practical part**; to enable students practices extraction methods and chromatography techniques.

9. Learning Outcomes, Teaching, Learning and Assessment Method

A. Cognitive goals

A1- Identifying all sources of natural products and raw medicines.
A2- Methods of extracting the active substances.
A 3- Study of chemistry and bio-structure.

B. The skills goals special to the course

B1 - Acquisition of skill in extraction methods
B2 - Acquisition of skill in isolating active compounds
B3 - Acquiring the skill in diagnosing separated vehicles

Teaching and Learning Methods

1- PowerPoint and Multimedia presentation
2- Class discussion
3- Presentation of cases
4- Theoretical lectures
5-Educational laboratories
6-Scientific research
7-Desk research

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

C1- Using modern methods of presenting lectures in the form of slides
C2 - Video clips and illustrations
C3 - Visit the botanical garden and submit scientific reports

Teaching and Learning Methods

1- Teaching and lecturing
2- Seminars and homework
3- Field visits
4- PowerPoint presentation

Assessment methods

1. Case-based scenarios
2. Homework
3. Electronic MCQs on the electronic platform
4. Mid-term exam
5. Final exam

D. General and rehabilitative transferred skills (other skills relevant to employability and personal development)
D 1- Practical experiments D2- Acquisition of computer skills D 3-Giving confidence to the student by discussing seminars

10. Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Introduction: General biosynthesis pathways ofsecondary metabolites.	1- Whiteboard and Power Point 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	Carbohydrates.		
3.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Glycosides: Biosynthesis,physical and chemical properties; cardiac glycosides; saponin glycosides; anthraquinone glycosides; flavonoid glycosides; cyanophore lycosides.		
4.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Glycosides: Isothiocyanateglycosides; aldehyde glycosides; alcoholic glycosides; phenolic glycosides; lactone glycosides; coumarins and chromones.		
5.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Resins and resin combination; tannins.		
6.	2	A1, A2, A3, B1, B2, B3, C1, C3, , D1, D2	Lipids: fixed oils andwaxes.		
7.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Volatile oils: Introduction;chemistry of volatile oils; biosynthesis of volatile oils; hydrocarbons as volatile oils; alcohols as volatile oils; aldehydes as volatile oils.		
8.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Ketones as volatile oils;Phenols as volatile oils; Oxides as volatile oils; Ester as volatile oils; Phenolic ethers as volatile oils.		
9.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Non- medicinal toxic plants.		
10.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Vitamins and Amino acids.		

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	Pharmacognosy and Supporting Sciences
3. Course title/code	Pharmacognosy II Practical / PH3102
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 Alkaloids , separation, and identification of constituents isolated from natural sources, using microscopes and chromatographic methods.

9. Learning Outcomes, Teaching, Learning and Assessment Method

A- 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

B- The skills goals special to the course
B1-Extraction practice
B2-Differentiation of plants
B3-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

C- 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 and work within academic institutions
C3- Good knowledge

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
1. Surprising inferential questions during the discussion in different aspects of education Homework
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)
D1-Discussing different Natural and finding appropriate crude drugs for them.
D2-Asking brainstorming questions through which the student can link the study materials together and link them to the health reality
D3- Knowledge about natural sources

10. Laboratory Course Structure					
Week	**Hrs.**	**ILOs**	**Unit/Module or Topic Title**	**Teaching methods**	**Assessment methods**
1 to 4	1	A1, A2, A3, B1	Alkaloids: introduction ,physical and chemical properties ,classification of alkaloid ,alkaloidsgroups	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
5 to 8	1	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Phytotherapy: introduction ,principle, medicinal plan in selected health care system ,important natural products and phytomedicines used in pharmacy and medicine		
9-10	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Antibiotic : naturalsources, pathway synthetic pathway ,isolation andpurification		
9th	1	Medication Safety and Communic ation Skills	Knowing treatment errorsand ways to address them		
10th	1	Strategies to Meet Specific Needs	Knowing the disease thatmakes communication difficult and how to dealwith it		

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 & new extraction techniques. -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	Al-Ayen Iraqi University - College of Pharmacy
2. College department/Center	Pharmacognosy and Supporting Sciences
3. Course title/code	Pharmacognosy III/ Theory /PH3205
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

1. **In the theoretical part**; Alkaloids: introduction ,physical and chemical properties Classification of alkaloid ,alkaloids groups.
2. Phytotherapy: introduction ,principle, medicinal plan in selected health care system ,important natural products and phytomedicines used in pharmacy and medicine
3. Antibiotic : natural sources, pathway synthetic pathway ,isolation and purification

In the Practical part; to enable students practices extraction methods from natural sources, pathway synthetic pathway ,isolation and purification

9. Learning Outcomes, Teaching, Learning and Assessment Method
A. Cognitive goals A1- Identifying all sources of natural products and raw medicines. A2- Methods of extracting the active substances. A 3- Study of chemistry and bio-structure.
B. The skills goals special to the course B1 - Acquisition of skill in extraction methods B2 - Acquisition of skill in isolating active compounds B3 - Acquiring the skill in diagnosing separated vehicles
Teaching and Learning Methods 1- PowerPoint and Multimedia presentation 2- Class discussion 3- Presentation of cases 4- Theoretical lectures 5-Educational laboratories 6-Scientific research 7-Desk research
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 C1- Using modern methods of presenting lectures in the form of slides C2 - Video clips and illustrations C3 - Visit the botanical garden and submit scientific reports
Teaching and Learning Methods 1- Teaching and lecturing 2- Seminars and homework 3- Field visits 4- PowerPoint presentation
Assessment methods 1. Homework 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)
D 1- Practical experiments
D2- Acquisition of computer skills
D 3-Giving confidence to the student by discussing seminars

10. Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	General Introduction toAlkaloids	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	General extraction and identification methods of Alkaloids .		
3.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Piperine Alkaloids.		
4.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2,	QuinolineAlkaloids.		
5.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Iso Quinoline Alkaloids.		
6.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	TropaneAlkaloids..		
7.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Harmala Alkaloids..		
8.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Imidazole alkaloids		
9.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Purine alkaloids		
10.	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	Pectin from lemon		

10. Laboratory Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1.	2	A3, B1, B2, B3, D1, D2, D3	General Introduction to Alkaloids	1- Whiteboard and PowerPoint and data show presentation 2- Class discussion 3- Presentation of cases 4- Handouts 3- Cases	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, B1, B2, B3, D1, D2, D3,	General extraction and identification methods of Alkaloids .		
3.	2	A3, B1, B2, B3, D1, D2, D3	Extraction and Isolation of piperine Alkaloids.		
4.	2	A3, B1, B2, B3, D1, D2, D3	Identification of piperine Alkaloids.		
5.	2	A3, B1, B2, B3, D1, D2, D3	Extraction and Isolation of Tropane Alkaloids.		
6.	2	A3, B1, B2, B3, D1, D2, D3	Identification of Tropane Alkaloids..		
7.	2	A3, B1, B2, B3, D1, D2, D3	Extraction and Isolationof Harmala Alkaloids..		
8.	2	A3, B1, B2, B3, D1, D2, D3	Identification of Harmala Glycosides.		
9.	2	A3, B1, B2, B3, D1, D2, D3			

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 & new extraction techniques. -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	Pharmacology I/ PH3202
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

1. The current course enables students to study types of medications, their uses, adverse effects of drugs, drug-drug interactions and interactions of drugs with body functions.

9. Learning Outcomes, Teaching, Learning and Assessment Method

A. Cognitive goals

1. Identify the main concepts in pharmacokinetics such as absorption, distribution, metabolism, and excretion.
2. Study the Pharmacodynamics of drugs
3. study adverse effects of drugs and drug-drug interactions

B. The skills goals special to the course

1. Empowering students to possess skills in conducting scientific experiments.
2. Empowering students to possess skills in dialogue, discussion and listening to others.

Teaching and Learning Methods

1- PowerPoint and Multimedia presentation
2- Class discussion
5- 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- Adhere to the highest standards of ethical and professional behavior in all aspects of treatment decision-making and patient care.
2- Evidence-based practice.
3- Collaborate effectively with other healthcare professionals for the best interest of the patient.

Teaching and Learning Methods

1- Lectures
2- PowerPoint presentation
3. Labs

Assessment methods

Theoretical and practical exams

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

1. Presentation of seminars.
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. Theory Course Structure					
Week	**Hrs.**	**ILOs**	**Unit/Module or Topic Title**	**Teaching methods**	**Assessment methods**
1.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	General introduction to pharmacology	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	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	Pharmacokinetics		
3.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	Drug receptor interaction and pharmacodynamics		
4.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	Autonomic nervous system		
5.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	Cholinergic system		
6.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	Anticholinergic agents		
7.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	Adrenergic system		
8.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	Principal of antimicrobial therapy		
9.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	B-lactam and other cell wall synthesis inhibitor antibiotics		
10.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	Quinolones, folate antagonists and urinary tract antiseptics		
11	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	Antimyobacterium drugs		
12	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	Antifungal drugs		
13	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	Antiprotozoal drugs		
14	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	Anthelmintic drugs		
15	2	A1,A2,A3,A4,B1,B2,B3,B4,B5,C1,C2,C3,C4,D1,D3,D4,D5	Antiviral drugs		

10. Laboratory Course Structure

Week	Hrs.	ILOs	Unit/Module or Topic Title	Teaching methods	Assessment methods
1.	2	A1,A2,A3,A4,B1,B2,B3,B4, B5,C1,C2,C3,C4,D1,D3,D4, D5	Routes of drug administration	1- Whiteboard and PowerPoint and data show presentation 2- Class discussion 3- Presentation of cases 4- Handouts 3- Cases	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,A4,B1,B2,B3,B4,B5, C1,C2,C3,C4,D1,D3,D4,D5	Onset and duration of drugs (barbiturates)		
3.	2	A1,A2,A3,A4,B1,B2,B3,B4,B 5,C1,C2,C3,C4,D1,D3,D4,D5	Absorption and excretion of drugs		
4.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5, C1,C2,C3,C4,D1,D3,D4,D5	Effect of parasympathomimetics on gland secretions		
5.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5, C1,C2,C3,C4,D1,D3,D4,D5	Drugs and human eye		
6.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5, C1,C2,C3,C4,D1,D3,D4,D5	The effects of drugs on IOP rabbits		
7.	2	A1,A2,A3,A4,B1,B2,B3,B4, B5,C1,C2,C3,C4,D1,D3,D4, D5	Evaluation of opioid analgesics		
8.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5, C1,C2,C3,C4,D1,D3,D4,D5	Evaluation of NSAIDS		
9.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5, C1,C2,C3,C4,D1,D3,D4,D5	Evaluation of anti-parkinsonian drugs		
10.	2	A1,A2,A3,A4,B1,B2,B3,B4,B5, C1,C2,C3,C4,D1,D3,D4,D5	Evaluation of anti-convulsant drugs		
11	2	A1,A2,A3,A4,B1,B2,B3,B4,B5, C1,C2,C3,C4,D1,D3,D4,D5	Effects of drugs and their antagonists on isolated rat ileum		
12	2	A1,A2,A3,A4,B1,B2,B3,B4,B5, C1,C2,C3,C4,D1,D3,D4,D5	Effects of drugs and their antagonists on isolated rabbit ileum		

11. Infrastructure	
Books Required reading	Lippencott's pharmacology, last edition
Main references (sources)	Lippencott's pharmacology, last edition
Recommended books and references (scientific journals, reports…).	
Electronic references, Internet sites…	

12. Course development plan
Not available