Academic Program Specification

for

Clinical Laboratory Sciences

2022-2021

Republic of Iraq

Ministry of Higher Education & Scientific Research

Supervision and Scientific Evaluation Directorate

Quality Assurance and Academic Accreditation

International Accreditation Dept.

Al-Ayen University

Academic Program Specification Form

University: Al-Ayen University
College: Pharmacy
Number Of Departments in the College: 6
Date Of Form Completion: 27/9/2021

Head of Department 's
Dr. Imad Zahreddine
Date: / /
Signature

Dean's Assistant for Scientific Affairs
Dr. Mazin Abed El Ghani Najim
Date: / /
Signature

المدرس الدكتور
معاون العميد للشؤون العلمية

The File verified by the Quality Assurance and University Performance Manager
Date: / /
Signature

Dean's Approval
Date: / /
Signature

الاستاذ المساعد الدكتور
عميد كلية الصيدلة

PROGRAM SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

PROGRAM SPECIFICATION

This program specification provides a concise summary of the main features of the program and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It is supported by a specification for each course that contributes to the program.

1. Educational institution	Ministry of Higher Education and Scientific Research – Al-ayen University
2. University department / Center	College of pharmacy
3. Academic program	Clinical Laboratory Sciences
4. The title of the final granted degree	Bachelor of Pharmacy
5. The educational system	Courses system
6. Accreditation program	Under preparation
7. Other external influences	Theoretical lectures + Educational laboratories
8. Date of description form preparation//Revision of this specification	27/9/2021

9. Academic Program Objective.

1. Make the graduate student capable of laboratory evaluation.
2. Developing the student's abilities in terms of developing laboratory skills on how to use equipment and how to conduct laboratory experiments.
3. Developing the student's ability to analyze the results and formulate them in the correct way.
4. Make the graduate student able to understand laboratory results in many branches such as hematology, serology, clinical biochemistry, immunology, bacteriology, mycology, parasites and viruses to assist doctors in diagnosis and making good decisions in treatment.
5. Make the graduate student able to educate patients regarding the results of laboratory reports.
6. Enabling the graduate student to follow up on medical conditions and treatment errors that may occur as a result of misunderstanding the results of laboratory tests.

10. Required program outcomes and teaching, learning, and assessment methods.

A. Cognitive goals

1. Enabling students to acquire and understand sciences related to tissues, anatomy, and microscopic chemistry.
2. Enabling the student to understand the basis of biochemistry.
3. Enable the student to follow developments in techniques used in clinical chemistry.
4. Enabling the student to have good knowledge in the fields of laboratory analysis.
5. The student acquires the knowledge and skills required to work on diagnosing diseases through laboratory tests.

B. The skill goals of the program

1. Conduct practical experiments.
2. Enabling students to have the ability to use modern devices and technologies related to pharmaceutical sciences.
3. Enabling students to possess the skills of using scientific research tools in the academic and scientific fields.
4. Enabling students to acquire the skills of dialogue, discussion, listening to others and accepting their opinions.
5. Enabling students to acquire self-learning skills to acquire new information, skills and knowledge.
6. Providing students with the skills of diagnosing medical errors using the results of clinical examinations.

Teaching and learning methods for cognitive and skills goals:

1- Lectures and various attendance methods.
2- Group discussion in the laboratory and lecture.
3- Educational laboratories.
4- Training in clinical laboratories.

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.Respect the patient's autonomy and preferences.
2.Training students to respect the rights of beneficiaries of their profession, culture, religion, gender and race.
3.Developing students' sense of responsibility during study and during work, and enhancing the spirit of cooperation and teamwork when requested.
4.Supporting drug culture among students and community members.
5.Educating students about professional humanitarian work, promoting, and consolidating professional and ethical values among students to practice the profession of pharmacist.
6.Raising students on a culture of integrity and fighting corruption in all its forms.

Teaching and learning methods

1. Writing self-reports.
2. Use a strategy of cooperation and assistance during the educational process.
3. Field visits to relevant ministries and educational institutions.
4. Organizing seminars, courses and workshops for students that encourage spiritual values.
5. Form a discussion group during the lecture.

Assessment methods

1. Surprising, inferential questions during the discussion on various aspects of education.
2. Homework.
3. Conducting volunteer campaigns.
4. Questionnaires

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

1. Conduct laboratory experiments using chemical equipment and devices.
2. Apply computer programs to analyze the results.
3. Use literature and materials to write a report on the data of a particular experiment.
4. Analyze, interpret and evaluate experimental data.
5. Gaining the ability to give lectures.

Teaching and learning methods

1- Explaining the results based on reports.
2- Using the computer to analyze the results.
3- PowerPoint and Multimedia presentation
4- Class discussion.
5- Visual aids: Utilize visual aids such as pictures, charts, graphs, diagrams
6- Clinical Labs training
7- Discussions

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

11. The program structure

Year / Semester	Course code	Course Title	Credit Hours	
			Theoretical	Practical
First / First	PH1101	Human Biology	2	2
First / Second	PH1201	Human anatomy	1	2
First / Second	PH1205	Histology	2	2
Second / First	PH2102	Medical Microbiology 1	3	2
Second / Second	PH2202	Medical Microbiology 2	3	2
Third / First	PH3104	Biochemistry 1	3	2
Third / First	PH3105	Pathophysiology	3	2
Third / Second	PH3204	Biochemistry 2	3	2
Fifth/ First	PH5104	Clinical Chemistry	3	2
Fifth/ First	PH5105	Clinical laboratory training	-	4
Fourth / Second	PH4105	Public health / Theory	2	-

12. Planning for personal development

1. Participation in training courses held within the college.
2. Participation in the professional courses held at the college within the prescribed curriculum, as well as the professional education courses held at the Pharmacists Syndicate after graduation, which helps in developing the graduate's personal skills within the professional and functional aspects.
3. There are specific modules within the program for personal development that give students the opportunity and encourage them to engage in professionally relevant qualifications that allow the students to reflect on their own professional development.

13. Admission Criteria

This is done according to the acceptance rate in the medical group (Faculty of Pharmacy) within the electronic form approved by the Ministry of Higher Education and Scientific Research (central admission). The central admission standards have been applied to the college since the 2017 academic year.

14. The most important sources of information about the program

-1Robert J. Cipolle, Linda M. Strand, Peter C. Morley. Pharmaceutical Care Practice: The Clinician's Guide, 3nd Edition.
2-ALISON BLENKINSOPP, PAUL PAXTON(eds), Symptoms in the Pharmacy. A Guide to the Management of Common Illness, 8th edition.
3- Roger Walker, Clive Edwards (eds), Clinical Pharmacy & Therapeutics 6th edition.
4- Barbara G.Wells & Joseph T. Diriro, Pharmacotherapy handbook 11th Edittion.
5- 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.
6-Applied Clinical Pharmacokinetics, third Edition, by Larry A. Bauer.
7- Robert S. Beardsley, (ed.); Communication Skills in Pharmacy Practice, 5th edition.
8-Drummond MF, O'Brien B, Stoddart GL, Torrance GW. Methods for the economic evaluation of health care programmes.
9-Robert m. Veatch and Amy Haddad. Case Studies in Pharmacy Ethics. Third edition.

Curriculum Skills Map																										
Please tick in the relevant boxes where individual Program Learning Outcomes are being assessed																										
Learning outcomes of the program																										
Year / Semester	Co ur se co de	Course name	Basic or optional	Cognitive goals					Skill goals of the program						Affective and value goals						General and rehabilitative skills				
				A					B						C						D				
				1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5
First / First		Human Biology	Basic	√	√	√						√	√								√				
First / Second		Human anatomy	Basic			√			√		√				√	√	√	√	√	√			√	√	
First / Second		Histology	Basic			√				√		√										√	√	√	√
Second / First		Medical Microbiology 1	Basic	√	√	√	√		√		√	√	√	√			√	√			√		√		√
Second / Second		Medical Microbiology 2	Basic	√	√	√	√		√		√	√	√	√			√	√			√		√		√
Third / First		Biochemistry 1	Basic	√	√	√	√		√		√	√	√	√			√	√			√		√		√
Third / First		Pathophysiology	Basic	√	√	√	√		√		√	√	√	√			√	√			√		√		√
Third / Second		Biochemistry 2	Basic	√	√	√	√		√		√	√	√	√			√	√			√		√		√
Fifth/ First		Clinical Chemistry	Basic									√													√
Fifth/ First		Clinical laboratory training	Basic					√				√													√
Fourth		Public health / Theory		√	√	√			√	√	√	√			√	√	√	√			√	√	√	√	

Course Description Form

Course Description

The textile course description for second-year pharmacy students covers the four basic human tissues, emphasizing structure and function to understand drug interaction. It combines theoretical lectures with practical applications, qualifying students to study the effects of drugs at the tissue level.

1. Educational Institution	Al-Ayen University - College of Pharmacy
2. Scientific Department	Pharmaceutics
3. Course Code	**Histology- PH1205**
4. Available Attendance Forms	Courses – Attendance
5. 3-semester/ year	Term 1
6. Number of study hours (total)	30hours
7. Date this description was prepared	27/9/2021

1. **Academic Program Objectives:**
   To determine the goals of a pharmacology histology program, it is important to consider the fundamental role of histology in understanding the microstructure of tissues and cells that make up organisms, and how this understanding can contribute to drug development and improved treatments.

1. Understanding the Microstructure of Human Tissues and Cells: Provide students with comprehensive knowledge about the structure of human tissues and cells, including the differences between different tissue types and how these tissues contribute to the functions of vital organs.

2. Applying knowledge in drug development and treatments: Learn how histology knowledge can be used to develop new drugs and improve treatments, including understanding how drugs can affect human tissue at the cellular level.

3**. Imaging and analysis techniques:** Providing students with the skills of using modern techniques in tissue imaging and analysis, such as light and electron microscopy, and how to apply these techniques in scientific research and drug development.

4**. Critical thinking and problem solving:** Developing critical thinking skills and students' ability to use their knowledge of histology to identify health problems and propose innovative solutions, especially in the areas of drug development and therapy.

5**. Ethics and Professional Responsibility**: Enhance students' understanding of professional ethics related to scientific research in histology and drug development, including ethical considerations for clinical trials and the use of biological data.

These goals form a solid foundation for the teaching of histology in the faculties of pharmacy, contributing to the preparation of graduates who are able to contribute effectively to the fields of scientific research, drug development, and health care improvement.

2. Required program outputs and teaching, learning and evaluation methods

A- Knowledge Objectives:

The Histology Program in the Faculties of Pharmacy aims to:

1. Enable students to gain comprehensive knowledge about human tissues, including cells, tissues, and organs.
2. Enhance understanding of how tissues and cells interact with drugs and their effects at the cellular level.
3. Develop application capability in practical scenarios to support drug development and treatment strategies.
4. Improve analysis skills to analyze histological data and interpret the results of drug trials.
5. Strengthening the evaluation capacity of scientific evidence and drug efficacy from a histology perspective.
6. Encourage creativity in the development of innovative solutions in the field of medicine, taking into account professional ethics.

These goals help prepare students who are able to contribute effectively to pharmacy and scientific research.

B- Program Skills Objectives:

The Histology Program in the Faculties of Pharmacy aims to develop students' practical and analytical skills through:

1. Recognition and classification: Enables students to accurately identify and classify tissue and cell types.
2. Microscopy: Developing the skills of using microscopes to image and analyze tissues.
3. Experimentation: Students gain experience in conducting histological experiments and analyzing data.
4. Research: Enhance research and inquiry skills to access new knowledge.
5. Communication: Improve students' ability to convey scientific concepts clearly.
6. Critical Thinking: Develop the ability to analyze data and solve practical problems.
7. Ethics: Promoting awareness of the ethics of scientific research and the use of samples.

These objectives contribute to the preparation of qualified graduates to contribute effectively to the field of pharmacy and research.

Teaching and Learning Methods:

1- Lectures on Multi-Attendance Methods

2- Group discussion in the lab and lecture
3- Educational Labs
4- Hospital Training
5- Presentation and discussion of patients' cases

Methods of Evaluation:

Quizzes
2- Oral exam and direct questions
Midterm exam
final examination
5-The Oshki exam (an international system to test the speed of students' performance in reading and dispensing prescriptionsand the method of Dealing with Patients(

C- Emotional and value objectives:

The Histology Program in the Faculties of Pharmacy aims to develop:

1. Respect for life: Encourage an appreciation of life and the importance of tissues for health.
2. Ethical Awareness: Developing an understanding of ethical responsibilities in scientific research.
3. Group work: Promote cooperation between students.
4. Commitment to continuous learning: Encouraging students to continue professional development.
5. Professional Responsibility: Developing a sense of responsibility towards the community.
6. Valuing Diversity: Promoting respect for cultural and individual diversity.

7. Self-confidence and initiative: Encourage the development of confidence and innovation.

These goals reflect the program's commitment to preparing graduates equipped with high skills and positive values towards their profession and society.

Teaching and Learning Methods:

1. Using a smart whiteboard to present information in an interactive and visual way, which enhances students' understanding and interaction.
2. Slideshows of human tissue material on the screen to illustrate key points and intricate details, making it easier for students to visually understand concepts.
3. The study of human tissues under a microscope, enabling students to see the microstructures of tissues and understand their functions more deeply.
4. - Using scientific references to provide rich and reliable sources of knowledge, which promotes self-research and inquiry-based learning among students.

Methods of Evaluation:

Methods of evaluation in the Histology Program at the faculties of pharmacy include:

1. Theoretical exams: to assess basic and advanced understanding of histology.
2. Lab reports: Reflect students' ability to conduct experiments and analyze results.
3. Presentations: To assess the ability to convey scientific information clearly.
4. Practical tests: Evaluate the skills of using microscopes and analyzing tissues.
5. Research projects: To measure the ability to design and carry out research in histology.
6. Self-assessment and peer assessment: Encourages critical assessment and collaborative learning.
7. Class participation and interaction: Reflects students' interest and understanding of the material.

3. Personal Development Planning:

1. Participating in the training courses held within the college.
2. Participating in the vocational courses held in the college within the curriculum prescribed for him, as well as the vocational education courses held in the Pharmacists Syndicate after graduation, which helps in developing the personal skills of the graduate within the professional and functional aspect.
3. There are specific modules within the programme for personal development and to give students the opportunity and encourage them to engage in professionally relevant qualifications that allow the student to reflect on their own professional development.

Course Development Line

8. 10. Course Structure

Week	Hours	Learning outcomes required for the program*	Module Name/ or Topic	teaching method	Valuation Method
1	4	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Integumantery System	Lecturing and discussing in-person and data show	Written and oral tests and direct questions
3	4	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Circulatory System		
5	4	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Lymphatic System		
6	4	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Respiratory System		
7	4	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**Skin** System (Oral cavity)		
8	4	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Digestive System (digestive tract)		
9	4	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,D1,D2,D3 ,D4,D5	**Digestive System (digestive glands ,Liver** ,Pancreas ,Gall bladder)		
10	4	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	Urinary System		
13	4	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Reproductive System(female reproductive system) Reproductive System(male reproductive system)		
14	4	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Accessory glands		
15	4	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	Final exam		

Practical course

Hours	Learning outcome	Module Title/ or Topic	Teaching Methods	Assessment methods
2	Understand the basic concepts of tissue and cell structure.	Introduction to Tissue	Lecture, PowerPoint presentation	Multiple Choice Examination Questions
4	Determine the structural and functional characteristics of the four basic tissue types.	Tissue types	Lecture, practical hands-on sessions using microscopes	Practical Exam, Short Answer Questions
4	Understand the histological structure of major organs and systems.	Fabric of organic systems	Interactive lecture, microscopic laboratory analysis	Lab Reports, Oral Exam
3	Apply histological knowledge to understand pathological changes.	Histopathology Fundamentals	Case studies, group discussion	Case study analysis, multiple choice questions
3	Linking tissue structures to their functions in health and disease.	Relationship between structure and function	Seminar, student offers	Bid evaluation, written exam
2	Develop technical skills in preparing and examining tissue segments.	Techniques in Tissue	Laboratory Practical Training	Practical Skills
2	Analyze tissue slices accurately.	Slide Analysis Workshop	Guided hands-on session	Practical exam, peer review

9.

Teaching methods

1. **PowerPoint Lectures and Presentations: To present concepts and provide an overview.**
2. **Laboratory practical sessions: A practical experiment using microscopes to examine tissue samples.**
3. **Case studies and group discussions: Analyzing real-life examples of the application of theoretical knowledge.**
4. **Seminars and student presentations: Encourage deep understanding and facilitate peer-to-peer learning.**

5. Laboratory Practical Training: Developing skills in preparing and examining slides.

Assessment methods

a. **Multiple Choice Questions (MCQs) and Short Answer Questions: Assessing Comprehension of Theoretical Knowledge.**
b. **Practical Examination and Skills Testing: Assessing practical skills in preparing and analyzing tissue segments.**
c. **Lab Reports: Reflect on lab practical work and results.**
d. **Oral Exam and Presentation Evaluation: Assessing understanding and ability to communicate effectively.**

2. - Case study analysis and peer review: applying knowledge to specific scenarios and evaluating analytical skills.

10. Infrastructure	
1- Required textbooks	Atlas of-Histology with function and clinical correlations (Dongmei Cui), 2011 General history E.F.Barinov, O.N.Sulayeva, ,B.P.Tereschuk L.I.Khlamanova, E.V.Chereshneva,K.I.Gatina .I.A.Prylutskay 2011*a*Copyright © 2008 by Oxford University Press, Inc
2- Main References	The Histology program in the faculties of pharmacy relies on important references such as: 1. “Histology: A Text and Atlas” by Ross and Pawlina: a combination of text and images to understand tissue structure. 2. "Junqueira's Basic Histology" by Mescher: full explanation with photo illustrations. 3. “Wheater's Functional Histology” by Young et al.: Provides an understanding of tissue function.

	4. "Cell Biology and Histology" by Gartner and Hiatt: focuses on cellular and molecular aspects. 5. Scientific journals and research: such as the "Journal of Histology" for the latest developments in tissues. 6. Electronic databases: such as PubMed to access scientific research and articles. 7. Online Learning Resources: For additional lectures and learning materials. These references contribute to deepening students' understanding and developing their research skills.
أ) **Recommended books and references (scientific journals,reports ,.....)**	Internet PowerPoint Presentations
ب) **Electronic references,websites ,.....**	N/A
11.Course Development Plan	
N/A	

Course Description Form

Course Description

This course serves as an introductory rule to the terminology system. This explains the basics of medical terminology by analyzing its construction, including: prefixes, suffixes, roots, and plural forms. The student acquires an understanding of the medical meanings applied to the function, structure and diseases of the human body. Abbreviations and their appropriate uses are represented.

1. Educational Institution	Al-Ayen University – College of Pharmacy
2. Scientific Department/ Center	Laboratory and Clinical Sciences
3. Course Code	Biology of Human-PH1101
4. Available Attendance Forms	Courses – Attendance
5. 3-semester/ year	Term 1
6. Number of study hours (total)	15th hour
7. Date this description was prepared	27/9/2021

8. Course Objectives

The human biology course aims to:

1. Biological Foundations: Learning cells, tissues, and body organs.
2. Structure and function: The study of body systems such as nervous and circulatory.
3. Physiological processes: understanding breathing, digestion, etc.
4. Structure and function: Analysis of the impact of the structure on the function.
5. Practical application: Using knowledge to understand diseases and treatments.
6. Critical Thinking: Encourage analysis and problem solving.
7. Ethics in Research: Emphasizing ethics in biological research.

The course aims to provide students with an in-depth understanding of human biology, enabling them to apply this knowledge in the fields of medicine and research.

9. Course Outcomes and Teaching, Learning and Evaluation Methods

A- Knowledge Objectives.

The objectives of human biology in the Faculty of Pharmacy include:

1. Understanding cells and tissues: Learn the structure and functions of cells and tissues.
2. The study of body systems: Understanding the structure and functions of different body systems.
3. Physiology: Analysis of vital processes such as breathing and digestion.
4. Structure and function: Evaluating the impact of anatomical structure on biological functions.

5. Clinical applications: Using knowledge to understand diseases and the effect of drugs.

6. Critical Thinking: Analyzing Information and Evaluating Scientific Evidence.

7. Ethics in research: Understanding ethical considerations in biological research.

It aims to enable students to apply knowledge in health and scientific research.

B - Course Skills Objectives

A human biology course aimed at developing practical and analytical skills for students in the College of Pharmacy, including:

1. Observation: Identification of tissues and cells under a microscope.
2. Experimental: Perform experiments accurately and use microscopes.
3. Analysis: Interpreting data in the context of body biology.
4. Communication: Present the results clearly verbally and in writing.
5. Research: Using sources to gather information about diseases and treatments.
6. Problem solving: Applying knowledge to propose solutions to health problems.
7. Teamwork: Collaboration in experiments and data analysis.
8. Ethical: Understanding ethical questions in biological research.

These goals help prepare students to contribute to scientific research, medicine, and health care.

Teaching & Learning

1- Lectures on the various means of attendance

2- Guiding students to some websites to take advantage of them.

3- PowerPoint presentation

Valuation Methods

1- Quizzes

2- Oral exam and direct questions

3- Midterm exam

4- Electronic exams on the electronic platform

5- Final Examination

C- Emotional and value objectives

A course in human biology that focuses on the development of emotional values and attitudes among students of the Faculty of Pharmacy, such as:

1. Valuing life: Deepening respect for life and its importance.
2. Ethics: Awareness of the importance of ethics in pharmaceutical science and practice.
3. Cooperation: Encourage teamwork and professional cooperation.
4. Empathy: Developing empathy for others and understanding the effects of diseases.

5. Continuous learning: Encouraging self-development and continuous learning.
6. Critical Thinking: Developing ethical flexibility and critical thinking.
7. Diversity: Respect for biological and cultural diversity.
8. Social Responsibility: Enhancing the contribution to public health and health awareness.

Teaching & Learning

Methods of teaching and learning in the subject of human biology at the Faculty of Pharmacy include:

1. Interactive lectures: to enhance basic and in-depth understanding.
2. PBL: To develop problem-solving and critical thinking skills.
3. Practical laboratories: to observe tissues and enhance understanding of structure and function.
4. Presentations and Group Discussions: To deepen understanding and develop communication.
5. Self-learning and research: To use electronic and library resources effectively.
6. Research projects: To apply knowledge and promote collaboration.
7. E-learning: To facilitate access to educational resources.
8. Evaluation and Feedback: To improve performance.
9. Scenario-based learning: to apply knowledge in practical contexts.

These methods aim to actively interact students in learning and prepare them for health and medical fields.

Valuation Methods

Methods of evaluation in human biology at the Faculty of Pharmacy include:

1. Theoretical exams: to measure understanding of biological concepts.
2. Laboratory reports: to assess practical and analytical skills.
3. Presentations: To measure the ability to communicate scientific information.
4. Practical tests: to evaluate the use of microscopes and tissue analysis.
5. Research projects: To measure the application of theoretical knowledge in research.
6. Self-assessment and peer assessment: to develop critical assessment and collaboration.

7. Class participation: To measure interaction and interest in the material. 8. Performance-based evaluation: To evaluate the application of knowledge in practical scenarios. These modalities ensure a thorough assessment of theoretical understanding and practical skills.

10. 10. Course Structure

Week	Hours	Learning outcomes required for the program*	Module Name/ or Topic	teaching method	Valuation Method
1	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	**Introduction to Human Biology:** General information, definitions, branches of Biology, levels of organization in the human body.	Lecturing and discussing in-person and data show	Written and oral tests and direct questions
2	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**Nutrition-Part I** Definitions, important food molecules		
3	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	**Nutrition-Part II** Digestion.		
4	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**Cell and cellbiology:** Cell structure, cell types, cell jobs.		
5	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**Cell and cell biology:** cell division and production of reproductive cells, fertilization.		
6	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**Tissues-Part I** Epithelial tissues, Connective tissues.		
7	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,D1,D2,D3 ,D4,D5	**Tissues-PartII** Muscular tissues, Nervous tissues.		
8	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	**Systems/Glandular System:** Types of glands and their structure.		

9	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**Systems:** Hormone s and hormonal system, adulthood and reproduction		
10	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	**Systems/ Immune system:** The parts and Job of the جهاز المناعة		
11	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	**Systems/Digesti ve system:** The general structure of the system including its organs starting from the mouth to the anus, with their Function		
12	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	**Introduction to Human Biology:** General information, definitions, branches of Biology, levels of organization in the human body.		
13	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Systems/Circulat orysy stem: The heart, circulatory system components, circulation.		
14	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Review for the Final exam		
15	1	final examination	Final exam		

Human Biology Weekly Course Schedule

assigned to the College of Pharmacy, which determines the distribution of weekly hours, desired educational outcomes (ILOs), module or topic titles, teaching methods, and assessment methods over a semester.

Week	Hours	Learning outcome	Module/Module Title or Topic	Teaching Methods	Assessment methods
1	3	Understand the basics of cell biology and genes.	Introduction to Human Biology and Cell Structure	Lecture, PowerPoint Presentations	Multiple Choice Examination Questions
2	3	To know about the main systems in the human body and their functions.	Overview of Human Body Systems	Interactive Lecture	Short Answer
3	3	Describe the structure and function of bony and muscular systems.	Musculoskeletal systems	Lecture, lab demonstration	Multiple Choice Examination Questions
4	3	Explain the mechanisms of the cardiovascular and respiratory systems.	Cardiovascular and respiratory systems	Group Discussion, Case Studies	Written assignmer oral presentation
5	3	Analysis of digestive and output systems.	Digestive and excretory systems	Laboratory practical training, practical sessions	Laboratory Repor Practical Examination
6	3	Diseases of the nervous system and sense organs	Diseases of the nervous system and sense organs	Seminar, student presentations	Bid Evaluation, Multiple Choice Questions
7	3	Understanding the glandular system and regulation of hormones.	Glandular system	Interactive lecture, group activities	Quiz, Peer Reviev
8	3	Exploring human reproduction and evolution.	Reproduction and development	Lecture, practical sessions	Practical Exam, Short Answer Questions
9	3	Understand the basic principles of immunology and the lymphatic system.	Immunology and Lymphatic System	Case Studies, Lab Presentation	Written Assignment, Lab Reports
10	3	Understand the principles of pharmacogenomics and its applications in pharmacology.	Introduction to Pharmacogenomics	Seminar, Guest Lecture	Quiz, Written Assignment
11	3	Apply knowledge to understand the impact of diseases on bodily functions.	Pathology	Group Discussion, Problem Based Learning	Case study analys multiple choice questions
12	3	Develop technical skills to analyze human biological samples.	Laboratory Techniques in Human Biology	Laboratory practical training, practical sessions	Practical Skills Test, Peer Review
13	3	Integrate knowledge through comprehensive case studies.	Case Studies in Human Biology	Interactive lecture, group discussion	Oral Exam, Comprehensive Exam
14	3	Review and prepare for final evaluations.	Retrospective	Review Lectures, Q&A Sessions	-
15	-	-	Final Exams	-	Final Exams

11.

12. Infrastructure

6- Required textbooks	Human Biology Douglas Wilkin, Ph.D Jean Brainard, Ph.D 2015
7- Main References	For the course of Human Biology in the Faculty of Pharmacy, the basic references include: 1. “Human Biology” by Mader and Windelspecht: for the obvious fundamentals of human biology. 2. "Essentials of Human Anatomy & Physiology" by Marieb: Covers the major systems in the body. 3. “Principles of Anatomy and Physiology” by Tortora and Derrickson: Provides a deep understanding of biological systems. 4. "Human Physiology: An Integrated Approach" by Silverthorn: For an integrated understanding of body functions. 5. “Atlas of Human Anatomy” by Netter: A Visual Source for Learning Human Anatomy. 6. Scientific journals: such as the "Journal of Human Biology", for the latest research. 7. Scientific databases: such as PubMed and ScienceDirect, for extensive access to research articles. These references promote learning and provide a basis for students in pharmaceutical research and practice.
ث) **Recommended books and references (scientific journals,reports ,.....)**	Previous article
ث) **Electronic references,websites ,.....**	

13. Course Development Plan

A plan for the development of a human biology course at the Faculty of Pharmacy aimed at:

1. Content update: to reflect the latest developments in human biology.
2. Enhancing Interaction: Using interactive learning strategies.
3. Diversify assessment: Introduce diverse assessment methods.
4. Technology Integration: To improve learning and resourcing.
5. Practical focus: Improve hands-on training.

Implementation steps include content review, expert consultation, development of new materials, teacher training, and periodic evaluation. Implementation requires funding, technology, and time. Outputs include an updated course and improved learning experience.

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 Aeyn University – College of Pharmacy
2. Scientific Department/ Center	Clinical Laboratory Sciences Branch
3. Course Code	Human Anatomy 2- PH1201
4. Available Attendance Forms	Courses – Attendance
5. 3-semester/ year	Semester II 2022-2021
6. Number of study hours (total)	45 hours
7. Date this description was prepared	27/9/2021

8. Course Objectives

1. Studying the general structure and trends of the human body
2. Studying the anatomy of different body systems
3. Understand and know some information in the histological and functional structure of the body organs
4. Understanding the relationship of different body systems to each other

9. Course Outcomes and Teaching, Learning and Evaluation Methods

أ- Cognitive goals.

Objectives of the Human Anatomy Course at the Faculty of Pharmacy:

1. Understanding anatomy: Being aware of the structure of the body and its various systems.
2. Identify organs: Identify organs and tissues and understand their functions.
3. Spatial relationships: Understand how organs and systems are spatially connected.
4. Functional Systems: Analyze system interactions to maintain health.
5. Clinical application: The use of anatomical knowledge in clinical contexts.
6. Self-learning: Encourage self-research to deepen understanding.
7. Valuing diversity: Understanding biodiversity and its impact on physiology.

The objectives are to enable students to effectively integrate anatomical knowledge into pharmacy practice and scientific research.

B - Course Skills Objectives

Skill Objectives for Human Anatomy at the Faculty of Pharmacy:

1. Practical Anatomy: Acquire the skills of using anatomy tools and understanding physical structure.
2. Systems Recognition: Learn to identify organs and tissues and understand their properties.
3. Structure and Function Analysis: Develop the ability to relate anatomical structure to physiological functions.

4. Effective Communication: Improve skills to clearly explain anatomical concepts.
5. Clinical application: Using anatomical knowledge to analyze clinical cases and diagnose diseases.
6. Research: Encourage research in anatomy and develop data collection and analysis skills.
7. Critical Thinking: Enhancing the ability to critically evaluate information and solve problems.
8. Continuous Learning: Urging students to self-learn and follow developments in anatomy.

It aims to enable students to efficiently integrate anatomical knowledge into pharmacy and healthcare.

Teaching and Learning Methods

1- Lectures on the various means of attendance
2- Group Discussion
3- Workshops and seminars
5-Presentationof cases
7-PowerPoint presentation

Valuation Methods

1- Quizzes
2- Oral exam and direct questions
Midterm exam
4- Electronic exams on the electronic platform
5. Final Examination

C- Emotional and value objectives

Emotional and value objectives for the subject of human anatomy in the Faculty of Pharmacy include:

1. Respect for Life: Appreciate the depth and beauty of human anatomy.
2. Ethical Awareness: Understanding ethics related to anatomy and medical research.
3. Empathy: Developing empathy with patients and improving health care.
4. Social Responsibility: Commitment to improving public health.
5. Valuing diversity: Valuing human diversity and its impact on health care.
6. Professional growth: Encourage continuous personal and professional development.
7. Collaboration: Promote teamwork and collaboration in educational and professional environments.
8. Cultural Sensitivity: Understanding the impact of culture on health and medical practices.

These objectives are aimed at instilling positive and professional values in pharmacy students, reinforced by respect and ethics in their future practices.

Teaching & Learning

Teaching and learning methods for human anatomy at the Faculty of Pharmacy include:

1. Interactive lectures: to explain the basic concepts.
2. Practical laboratories: to dissect models and understand structure.
3. Using the Anatomic Atlas: To learn the finer details.
4. PBL: To develop critical thinking.
5. Self-learning: To explore additional resources.
6. Group projects: to improve communication and cooperation.
7. Practical assessment: To assess the application of knowledge.
8. Technology: to support learning with software and simulation.

9. Seminars and Workshops: To get insights from experts.

10. Feedback: To improve performance and understanding.

These strategies ensure a holistic education that combines theory and practice, fostering the professional application of knowledge.

Valuation Methods

Methods of Evaluation in Human Anatomy at the Faculty of Pharmacy:

1. Theoretical examinations: to measure understanding of structure and anatomical functions.

2. Laboratory reports: To assess practical and analytical skills in the laboratory.

3. Presentations: To assess communication skills and explain concepts.

4. Practical tests: To measure the ability to identify organs and tissues.

5. Research projects: To assess the ability to conduct independent research.

6. Self-assessment and peer assessment: to promote critical thinking and collaborative learning.

7. Class participation: To measure interaction and interest in the material.

8. Performance-Based Evaluation: To measure the application of knowledge in clinical scenarios.

These modalities ensure an integrated assessment that includes both theoretical and practical aspects of the material.

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

1. Educating students on humanitarian and professional work.
2. Developing a sense of responsibility among students during the period of study and work.
3. Supporting the pharmacological culture among students and members of society.
4. Foster collaboration and teamwork

10. 10. Course Structure

Week	Hours	Learning outcomes required for the program*	Module Name/ or Topic	teaching method	Valuation Method
1	**(1Theoretical)** (2practical)	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Introduction to anatomy and anatomical description of an object Human	Lecturing and discussing in-person and data show	Written and oral tests and direct questions
2	**(1Theoretical)** (2practical)	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Circulatory system: Location of the vascular system (heart, arteries veins)		
3	**(1Theoretical)** (2practical)	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	|||UNTRANSLATED_CONTENT_START||| الجهاز اللمفاوي:|||UNTRANSLATED_CONTENT_END||| thymus gland Spleen and Ganglia Lymphocyte)		
4	**(1Theoretical)** (2practical)	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Lymph nodules and tonsils		
5	**(1Theoretical)** (2practical)	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5			

			The nervous system. (chuckles) (scanner beeps)		
6	**(1Theo retical)** (2practical)	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Respiratory system		
7	**(1Theo retical)** (2practical)	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,D1,D2,D3 ,D4,D5	Gastrointestinal System		
8	**(1Theo retical)** (2practical)	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	Glands attached to the device Digestive		
9	**(1Theo retical)** (2practical)	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Endocrine system		
10	**(1Theo retical)** (2practical)	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	The second part of the endocrine system		
11	**(1Theo retical)** (2practical)	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	The urinary system:		
12	**(1Theo retical)** (2practical)	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Reproductive system Male		
13	**(1Theo retical)** (2practical)	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Reproductive system - My feminine intuition.		
14	3	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	musculature		
15	3	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	final examination		

11.Infrastructure	
8- Required textbooks	He wrote a course for human anatomy at the Faculty of Pharmacy: 1. "Atlas of Human Anatomy" by Frank H. Netter: A detailed atlas of human anatomy. 2. "Clinically Oriented Anatomy" by Keith L. Moore et al.: focuses on clinical applications of anatomy. 3. “Gray's Anatomy for Students” by Richard Drake et al.: A comprehensive explanation of anatomy with a focus on students' needs. 4. "Essential Clinical Anatomy" by Keith L. Moore et al.: A brief anatomical reference covering the key points. 5. "Sobotta Atlas of Human Anatomy": an accurate depiction of anatomy with a focus on applied aspects. 6. "The Developing Human: Clinically Oriented Embryology" by Keith L. Moore and T.V.N. Persaud: Understanding embryonic anatomy and organ development. These books provide comprehensive and in-depth knowledge of human anatomy, with a focus on the important practical and clinical aspects of pharmacy students.
9- Main References	For the Human Anatomy course at the Faculty of Pharmacy, the basic references are: 1. "Atlas of Human Anatomy" by Frank H. Netter: For accurate illustrations. 2. "Clinically Oriented Anatomy" by Keith L. Moore et al.: focuses on clinical aspects. 3. “Gray's Anatomy for Students” by Richard Drake et al.: Provides comprehensive information in plain language. 4. "Essential Clinical Anatomy" by Keith L. Moore et al.: A brief reference to the necessary basics.

	5. "Sobotta Atlas of Human Anatomy": for precise anatomical details with high-quality drawings and pictures. 6. "The Developing Human: Clinically Oriented Embryology" by Keith L. Moore and T.V.N. Persaud: To understand embryonic development and anatomy. These references help students gain a deep understanding of human anatomy, with important clinical applications for the field of pharmacy.
ج) **Recommended books and references (scientific journals,reports ,.....)**	Internet PowerPoint Presentations
ج) **Electronic references,websites ,.....**	N/A

12. Course Development Plan

The plan for the development of the human anatomy course at the Faculty of Pharmacy includes:

1. Course Evaluation: Gathering feedback and analyzing performance.
2. Content Update: Integrate the latest research and review key references.
3. Improving teaching: developing interactive lectures and using technology.
4. PBL: Design clinical scenarios to apply knowledge.
5. Self-learning support: Provide online resources.
6. Evaluation Update: Diversify evaluation methods.
7. Practical development: Increasing practical training opportunities.
8. Training of teaching staff: workshops and training courses.
9. Ongoing review: Periodic evaluation of the course.

The plan aims to equip students with advanced anatomical knowledge and skills to apply in pharmacy and healthcare.

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 University – College of Pharmacy
2. Scientific Department/ Center	Laboratory and Clinical Sciences Branch
3. Course Code	Safety & Security
4. Available Attendance Forms	Courses – Attendance
5. 3-semester/ year	Term 1 **2021-2022**
6. Number of study hours (total)	15 h
7. Date this description was prepared	27/9/2021

8. Course Objectives

Objectives of the Biosafety and Security Course at the Faculty of Pharmacy:

1. Understanding the Principles: Learn the basics of biosafety and biosecurity.
2. Practical Application: Application of international standards in biosafety.
3. Risk Management: Effectively assess and manage biological risks.
4. Use equipment safely: Training on the safe use of protective equipment.
5. Emergency Response: Handling biological exposure incidents.
6. Ethical and Legal Awareness: Understanding ethics and laws related to biological work.
7. Communication Skills: Develop effective communication and documentation skills.
8. Continuous update: Stay up to date with the latest developments in biosafety.

The plan aims to qualify students to work safely and responsibly in healthcare and research environments.

9. Course Outcomes and Teaching, Learning and Evaluation Methods

A- Knowledge Objectives.

Objectives of the Biosafety and Security Course at the Faculty of Pharmacy:

1. Understand the basic concepts of biosafety, biosecurity and risk classification.
2. Familiarity with international standards and their practical application.
3. Effectively assess and manage biological risks.
4. Use protective equipment correctly to reduce exposure to hazards.
5. Respond to incidents effectively and apply biological aid.
6. Understand the ethics and laws associated with biological work.
7. Develop communication and documentation skills to ensure effective information sharing.
8. Encourage continuous learning to keep abreast of the latest developments in the field.

Objectives focus on enabling students to safely and responsibly handle biological materials in pharmaceutical and research environments.

B - Course Skills Objectives

The objectives of the biosafety and biosecurity course at the Faculty of Pharmacy:

1. Hazard Identification and Classification: Develop the ability to recognize and classify biological hazards.
2. Use prevention: Training in the effective use of preventive methods.
3. Risk Management: Enhance risk assessment and management skills.
4. Emergency Response: Develop the ability to respond to exposures and leaks effectively.
5. Communication and Documentation: Learn to clearly document and share information.
6. Standard Procedures Practice: Training on procedures to avoid accidents.
7. Critical Thinking: Developing critical thinking and problem solving.
8. Ethical and Legal Awareness: Promote awareness of ethical and legal responsibilities.

These goals aim to equip students to work safely and responsibly in healthcare and research environments.

Teaching & Learning

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

Valuation Methods

1- Quizzes
2- Oral exam and direct questions
1- Midterm exam
2- Electronic exams on the electronic platform
3- Final Examination

C- Emotional and value objectives

Affective and Valuable Objectives of the Biosafety and Biosecurity Course:

1. Importance and purpose: The course aims to promote awareness and appreciation of biological hazards and the importance of safety and security in the field of pharmacy, which contributes to the development of a safe and responsible work environment.

2. Affective goals:
- Risk Awareness: Understanding the risks of biological agents and the need to follow safety procedures.
- Respect for protocols: Appreciate the importance of procedures and preventive measures to maintain safety.
- Positive attitude: Encourage the development of a positive attitude towards biosafety and biosecurity.

3. Value Objectives:
- Responsibility and Integrity: Adhering to ethical and legal standards in dealing with biological materials.
- Professional ethics: Promote adherence to professional ethics and relevant legislation.
- Cooperation and teamwork: stimulating joint work and cooperation in the field of biosafety.

4. Practical application: The course includes practical applications that highlight how to implement these objectives in realistic scenarios, such as in-lab exercises and initiatives that promote safety practices.

5. Conclusion: Biosafety and biosecurity are integral to pharmaceutical education, with a focus on cultivating and fostering positive values and attitudes towards these important practices.

Teaching & Learning

1- 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).

The Biosafety and Biosecurity course provides students of the Faculty of Pharmacy with a variety of general and qualifying skills that contribute to increasing their employability and supporting their personal development. The following is a summary of these skills:

1. Occupational safety and health awareness: Learning the basics of biosafety and biosecurity promotes awareness of the importance of maintaining a safe work environment, which reduces health risks and protects both individuals and society.

2. Critical thinking and problem solving: The course encourages critical thinking in risk analysis and devising effective solutions to the biological and health challenges you may face in the professional environment.

3. Research skills: Students acquire the ability to research and evaluate scientific and technical information related to biosafety and biosecurity, which enhances their research skills and ability to make informed decisions.

4. Effective communication: Biosecurity requires clear and effective communication with colleagues and management about risks and preventive actions, which enhances oral and written communication skills.

5. Teamwork and Collaboration: Safety and biosecurity training encourages teamwork, as students learn how to collaborate with others to ensure a safe and effective work environment.

6. Flexibility and Adaptability: The course enhances students' ability to adapt to new changes and developments in biosafety and biosecurity, making them more resilient in a changing work environment.

7. Ethical and Professional Responsibility: The course works to establish ethical and professional values, such as integrity and responsibility, that are critical in the field of biosafety and biosecurity.

These skills pave the way for students to become qualified and responsible professionals, able to contribute effectively to the field of pharmacy and beyond, while enhancing their employability and career development.

10. 10. Course Structure

Week	Hours	Learning outcomes required for the program*	Module Name/ or Topic	teaching method	Valuation Method
1	1	A1 , A2 , A3, B1, B2,B3 ,C1	Students' acquisition of preliminary information in The field of safety and biosecurity and the management of safety vocabulary in all laboratories	Lecturing and discussing in-person and data show	Written and oral tests and direct questions
2	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Students acquire information about personal protective tools Protective designs for facilities and laboratories		
3	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Students gain information in the field of risk assessment strategies Biological		
4	1	A1 , A2 , A3,A4, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Students acquire information in the field of classification of biological factors		

			and the ways of its spread		
5	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Students acquire information in the field of biological risk control and how to deal with blood samples and other samples		
6	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Students' acquisition of information in Managing and evaluating laboratories and materials in terms of biological hazard		
7	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,D1,D2,D3 ,D4,D5	Students acquire biologic waste information and classify it		
8	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	Students acquire information in the field of transporting biological materials		
9	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C7,D1,D2,D4 ,D5	Students acquire information in the field of incident response		

10	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Students acquire comprehe nsive informatio n for safety supplies and tools and security		
11	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,C4 ,C5,D1,D2,D4 ,D5	Acquisition of initial information by students Biosecurity		
12	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Students acquire informati on in the field of microbiol ogy to Meets Expectations		
13	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	Practical applications of biosafety laws in laboratories		
14	1	A1 , A2 , A3, B1, B2,B3 ,C1,C3,D1,D2	**Training students in safety procedures** Practically speaking		
15	1		REVISION		

11. Infrastructure

Required textbooks	World Health Organization. A Laboratory Manual. Geneva: World Health Organization. For students of the Faculty of Pharmacy, there are several basic sources that are an important reference in the subject of safety and biosecurity. Here is a short list of some recommended books and courses: 1. "Biosafety in Microbiological and Biomedical Laboratories": This manual is one of the most important references in the field of biosafety, and provides comprehensive standards and guidelines for safe work with biological materials. 2. “Principles of Biosafety and Biosecurity”: This book provides an overview of biosafety principles, including safe laboratory design and biological waste management. 3. "Laboratory Biosafety Manual" of the World Health Organization: This manual is an international reference for safety practices in laboratories dealing with biological materials and includes guidance on assessment and risk management. 4. “Fundamentals of Biological Safety”: This book covers basic aspects of biosafety, including biohazard classification, sterilization, and pollution control. 5. “Biosecurity in Microbiology and Biomedical Facilities”: This book focuses on biosecurity concepts, and discusses how to prevent unauthorized access to hazardous biological materials. 6. Electronic Courses and Resources: There are many online courses and resources available that offer training on biosafety and biosecurity, such as those offered by the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO). These resources provide pharmacy students with the basic and advanced knowledge needed to understand and apply biosafety and biosecurity standards in the pharmaceutical and research work environment.
Main References	same as above
خ) **Recommended books and references (scientific journals,reports ,.....)**	For students of the Faculty of Pharmacy interested in biosafety and biosecurity, it is advisable to refer to a set of specialized books, references, and scientific journals that cover various

	aspects related to this field. Here is a short list of some of the key recommended sources: Books and Manuals: 1. "Biosafety in Microbiological and Biomedical Laboratories (BMBL)" 5th Edition: This manual is a publication of the Centers for Disease Control and Prevention (CDC) and the National Institute of Health (NIH) and is a fundamental reference in biosafety standards. 2. “Laboratory Biosafety Manual” – World Health Organization (WHO): Provides international guidance for safe practices in biological laboratories, with a focus on risk management. 3. “Biosecurity: Understanding, Assessing, and Preventing the Threat”: This book explores biosecurity concepts and offers strategies for assessing and preventing biological threats. C/N H. Roldos de la Sovera, Montevideo 1. Journal of Biosafety and Biosecurity: A journal that publishes research and reviews on the latest developments in the field of biosafety and biosecurity. 2. Applied Biosafety: A journal focused on biosafety practices in research and higher education, including case studies and strategies for improving safety in laboratories. 3. Infection Control and Hospital Epidemiology: publishes research related to infection prevention and control in healthcare settings, including aspects of biosafety. Reports and electronic resources:

	1. CDC's Biosafety Home Page: The CDC website provides a wide range of resources and reports on biosafety, including guidance, risk assessment tools, and training information. 2. who's Laboratory Biosafety Manual Online: The who website offers the latest version of the Laboratory Biosafety Manual in the form of downloadable resources. Reference to these resources will help pharmacy students deepen their understanding of the principles and practical applications related to biosafety and biosecurity, enhancing their knowledge and contributing to their academic and professional development.
د) **Electronic references,websites ,.....**	For pharmacy students interested in biosafety and biosecurity, there are a range of online references and important websites that provide valuable information and educational resources in the field. Here are some of these sources: Graphic via the Centers for Disease Control and Prevention (CDC). - Link: CDC Biosafety - Provides biosafety information, protocols, and guidelines for safe laboratory work. 2. World Health Organization (WHO) - Laboratory Biosafety Manual: - Link: who Laboratory Biosafety Manual - Provides basic evidence of safety in the laboratory, including new releases and updates. 3. International Federation for Biosafety (IFBA): - Link: International Federation of Biosafety Associations - Includes resources and training programs to enhance knowledge about biosafety and security globally. 4. BioRisk Association of Singapore (bras): Link:

	- Provides information and training on best practices and developments in biosafety. Occupational Safety and Health Administration (OSHA) - Link: OSHA Biological Agents - Provides safety guidelines and standards related to the handling of biological agents at work. American Biological Safety Association (ABSA) - Link: ABSA International - It is a source of professional standards, education and research in the field of biosafety and biosecurity. 7. PubMed: - Link: PubMed - A database for medical and scientific research that includes many studies on biosafety and security. These sites offer a wide range of information, from biosafety guidelines and protocols to the latest research and developments in the field. Pharmacy students are advised to utilize these resources to enhance their knowledge and skills in biosafety and biosecurity.

12. Course Development Plan
To develop the biosafety and biosecurity course for pharmacy students, the plan includes needs analysis, updating the content with the latest research, promoting practical learning through simulation laboratories and field visits, integrating technology in education, developing evaluation and feedback, cooperating with industry to provide practical training, reviewing and continuous updating, and focusing on developing soft skills to enhance employability.

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 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 2022-2021
6. Number of study hours (total)	45 hours
7. Date this description was prepared	27/9/2021

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 membrane and the morphology of bacteria.	Cytoplasmic membrane and bacterial morphology	Lecture, practical sessions using microscopes	Multiple Choice Examination Question

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	Comprehen sive 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.
ذ) **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.
ر) **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 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 2023-2022
6. Number of study hours (total)	45 hours
7. Date this description was prepared	1/10/2022

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

Quizz 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	Assessmen 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 Answe
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

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 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	27/9/2021

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 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	27/9/2021

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 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	27/9/2021

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

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 University - College of Pharmacy
2. College department/Center	Clinical pharmacy
3. Course title/code	Clinical Chemistry-PH5104
4. Modes of Attendance offered	Full-time and official attendance hours
5. Semester/Year	First Semester / Fifth Year
6. Credits (total)	45 h Theory + 30 h Lab
7. Date of description form preparation//Revision of this specification	27/9/2021

8. Course Objectives

1. Helping to understand the principles of clinical chemistry.
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 clinical chemistry topics.

9. Learning Outcomes, Teaching, Learning and Assessment Method

I. Cognitive goals

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

J. 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- Multimedia lectures
2- Group discussion
3- Workshops and seminars
4- Laboratory training
5- Small group tasks
6- Power Point presentation

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

K. 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.

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

1. Communicating ideas regarding clinical chemistry.
2. Displaying lectures with drawings and pictures.
3. Using 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	Liver Function	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	Calcium Metabolism		
3.	2	A1, A2, A3, B1, B2, B3, C1, C2, C4, C5, D1, D2, D4, D5	Kidney + Calcium		
4.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Endocrinology		
5.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Hypothalamus		
6.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Adrenal Gland		
7.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Reproductive System		
8.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Pregnancy		
9.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Hyperlipidemia		
10.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Hyperlipidemia		
11	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Tumor Marker		
12	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Carbohydrates		
13		A1, A2,, A4, B1, B2, B3, B5, C1, C2,C5, D1, D2, D4, D5	Acid-base Balance		
14		A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Clinical Enzymology		
15		A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Revision		

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	Estimation of blood glucose	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 CK activity		
3.	2	A1, A2, A3, B1, B2, B3, C1, C2, C4, C5, D1, D2, D4, D5	Estimation of serum bilirubin + phosphate		
4.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Estimation of blood urea		
5.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Estimation of serum creatinine		
6.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Estimation of uric acid level in the blood		
7.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Estimation of serum cholesterol		
8.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Estimation of serum HDL-cholesterol		
9.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Estimation of serum triglycerides		
10.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Estimation of serum LDL-cholesterol		
11	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Estimation of AST and ALT enzymes		
12	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Immunodeficiency disorders		
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	Revision		

11. Infrastructure	
Books Required reading	Clinical chemistry crook last edition
Main references (sources)	
Recommended books and references (scientific journals, reports…).	Clinical chemistry marshal last edition
Electronic references, Internet sites…	.

12. Course development plan
Adding some materials, such as the effect of medications on the measurement of some laboratory tests.

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 University - College of Pharmacy
2. College department/Center	Clinical pharmacy
3. Course title/code	Clinical laboratory Training-PH5105
4. Modes of Attendance offered	Full-time and official attendance hours
5. Semester/Year	First semester /Fifth Year
6. Credits (total)	48 h
7. Date of description form preparation//Revision of this specification	27/9/2021

8. Course Objectives

1. Help in understanding chemical and biological analyses.
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 related to training materials

9. Learning Outcomes, Teaching, Learning and Assessment Method

M. Cognitive goals

1. Practical application to laboratory experiments
2. Statement of basic knowledge and principles in hospital training material.

N. 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- Discussing group work in the laboratory.
2- Workshops and seminars.
3- Training in clinical laboratories.
4- Small group tasks.
5- PowerPoint presentation

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

O. 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.

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

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

10. 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	Basics of diagnostic testing, sample collection and transport, venipuncture, urine samples, stool samples	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	Basics of diagnostic testing, sample collection and transportation, venipuncture, urine samples, stool samples		
3.	2	A1, A2, A3, B1, B2, B3, C1, C2, C4, C5, D1, D2, D4, D5	Biochemical tests: fasting blood glucose, postprandial glucose		
4.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Oral glucose tolerance test		
5.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Blood urea, blood creatinine		
6.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Creatinine clearance, uric acid		
7.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Cholesterol and lipoproteins		
8.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Triglyceride.		
9.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Blood proteins		
10.	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Bilirubin		
11	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Calcium and inorganic phosphate		
12	2	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Serum chloride		
13		A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Alkaline phosphatase, acid phosphatase, alanine aminotransferase		

14		A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Aspartate aminotransferase, lactate dehydrogenase, creatine phosphokinase		
15		A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2, C4, C5, D1, D2, D4, D5	Serological tests: VDRL		

11. Infrastructure	
Books Required reading	Fischbach ; manual & laboratory &diagnostic tests \10 th edition 2020
Main references (sources)	
Recommended books and references (scientific journals, reports…).	Lehninger (principles of biochemistry) 7 edition 2017
Electronic references, Internet sites…	

12. Course development plan
1. Developing students' skills by training them on laboratory equipment in central health laboratories. 2. Maintaining scientific sobriety through the use of valuable sources and international books.

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 University - College of Pharmacy**
2. College department/Center	**Pharmacy / Clinical laboratory science**
3. Course title/code	**Public health / Theory-PH4105**
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	**27/9/2021**

8. Course Objectives

1-Learn pharmacy students about the diseases (causes, diagnosis, control), and prepare the student to understand the body defense against infection through studying the vaccines

1-To obtain an insight in the various aspects of the pharmacy practice. The practice of pharmacy face wide range of challenges that the student need to be acquainted with and introduced to and be familiar with rational approach to solve them this course is an introductory course to the fourth who already have a glimpse of some aspects of pharmacy practice

9. Learning Outcomes, Teaching, Learning and Assessment Method
E. Cognitive goals **At the end of the course, students are expected to be able:** **1- To understand the diseases according to body system.** **2- To understand the causes of infectious disease.** **3- To diagnose and control the disease.**
F. The skills goals special to the course **The skills goals special to the program.** **1 - Theoretical application on practical experiences** **2 - Use of the devices by the student** **3 - Action Posters multiple topics**
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**
G. Affective and value goals **C1- Using modern methods of presenting lectures in the form of slides** **C2 - Video clips and illustrations** **C3 -Connecting chemical Albaaloger ideas and terms that are comprehensible to the student** **Use information from a variety of sources including scientific journals**
Teaching and Learning Methods **-Seminars** **- daily assignments** **- written exams**
Assessment methods **4. Oral and written exams and writing reports on practical experiences.**
H. General and rehabilitative transferred skills (other skills relevant to employability and personal development) **1. planning and implementation of laboratory experiments using chemical equipment and apparatuses** **2. analyze, interpret and evaluate experimental data and make a quantitative assessment of the mistakes in the experimental measurements** **3. The application of computer programs for the analysis of experimental data and writing scientific reports**

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	-Introduction: the Scope and Concerns of Public Health.	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	Epidemiology & Population Screening.		
3	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	- Prevention & Control of Disease (preventive medicine).		
4	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2, D3	-Health Insurance (Organization of Health Services).		
5	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2,	- Communicable Diseases (Transmission of Infection Acquired Through the Gastro-intestinal Tract).		
6	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2,	- Control of Infection Acquired Through the GIT.		
7	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2,	- Transmission & Control of Infection Acquired Through the Mucous		
8	2	A1, A2, A3, B1, B2, B3, C1, C3, , D1, D2,	- Transmission of Air- borne Infections.		
9	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2	- control of Air- borne Infections.		
10	2	A1, A2, A3, B1, B2, B3, C1, C3, D1, D2,	- Non- Communicable Diseases (Chronic Disease, Public Mental Health).		

11. Infrastructure	
Books Required reading	1. AIDS and Accusation by Paul Farmer. 2. The Invisible Cure by Helen Epstein. 3. The Healing of America by T. R. ... 4. Flu by Gina Kolata. 5. Betrayal of Trust by Laurie Garrett. 6. Introduction to Public Health by Mary-Jane Schneider.
Main references (sources)	Flu by Gina Kolata. Betrayal of Trust by Laurie Garrett. Introduction to Public Health by Mary-Jane Schneider.
Recommended books and references (scientific journals, reports…).	The Invisible Cure by Helen Epstein. The Healing of America
Electronic references, Internet sites…	Periodicals, Web Sites, …. etc http://www.health science l.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

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