

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



Academic Program and Course Description Guide

2025

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: Basrah

Faculty/Institute: Science

Scientific Department: Pathological analyses

Academic or Professional Program Name: B.Sc. Pathological analyses

Final Certificate Name: B.Sc. pathological analyses

Academic System: Courses

Description Preparation Date: 10/9/2025

File Completion Date: 10/9/2025

Signature:

Head of Department Name:

Prof. Dr. Shereen Jawad Al-Ali

Date: 10/9/2025

Signature:

Scientific Associate Name:

Date:



The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Dr. Darya Ali Hussain
10/9/2025

Approval of the Dean

الأستاذ الدكتور
عادل علي عبد الامام عبد الزهرة
عميد كلية العلوم / جامعة البصرة

1. Program vision

The Department of Medical Analysis seeks to be a leader and distinguished among the departments of faculties of science at the national, Arab, and global levels in the fields of theoretical and applied medical analysis. The department's vision is to contribute effectively to serving health institutions and society and to supply the labor market with competent cadres in all its specializations that comply with global quality standards and the Quality and Academic Accreditation Guide issued by the Ministry of Higher Education and Scientific Research.

2. Program Mission

The Department of Medical Analysis seeks to provide the best laboratory services to governmental and non-governmental sectors in the field of medical diagnosis through its outputs of specialized cadres in the fields of medical analysis. The department works to diagnose current and future needs in the fields of specialization and respond to them effectively by ensuring quality in all educational, research, and advisory aspects. This is achieved by engaging the department's teaching and functional staff in specialized training and development courses to improve overall performance and prepare comprehensive plans and programs to develop work and prepare the requirements and supplies so that the department's outputs of students are at a high level of scientific knowledge and technical skills that contribute to improving health care, in addition to holding periodic seminars, workshops, and conferences to serve scientific research and society.

3. Program Objectives

- * Educate and train a qualified academic staff by preparing specialized graduates in medical analysis who possess the theoretical and practical skills necessary to work in the academic, governmental, and industrial sectors and to provide advanced academic programs in the field of medical analysis.**
- * Leadership in scientific research and health technological development by supporting and developing scientific research in the fields of medical diagnosis, and encouraging research projects that address local and global health issues.**
- * Promote sustainable health by raising the awareness of individuals and communities about the importance of periodic check-ups through educational and awareness programs targeting various age and social groups, as well as developing educational curricula that focus on public health and its impact on daily life.**
- * Work to solve health problems such as diagnosing infectious and chronic diseases, in cooperation with governmental bodies and non-governmental organizations, and developing innovative solutions through research and field application.**
- * Contribute effectively to planning health policies by working with relevant ministries, such as the Ministry of Health, to provide scientific solutions based on data collected through research and health surveys.**
- * Implement quality standards and academic accreditation issued by the Ministry of Higher Education and Scientific Research, which contributes to raising the level of education and scientific research in the fields of medical analysis.**

4. Programmatic Accreditation

yes

5. Other External Influences

The program is subject to the requirements of the national standards of the Council for the Accreditation of Science Programs

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	7	14	10%	
College Requirements	9	26	18%	

Department Requirements	37	105	72%	
Summer Training				
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
First	Path-102	General Medical Microbiology	3	1
	Path-103	Human Anatomy	2	1
	Path-104	Principles of pathological analyses	2	1
	Path-105	Analytic chemistry	3	1
	Path-106	Medical terminology	2	0
	Bio-100	Human cytology	2	1
	Uni-117	Statistics	2	0
	Uni-118	Biostatistics	2	0
	Uni-127	Computer	2	1
	Phy-136	Medical physics	2	1
	Uni-101	Arabic language	2	0
	Uni-102	Sport	1	0
	Uni-103	Freedom & democracy	3	0
	Uni-104	Professional ethics	1	0
Second	Path-201	Human histology	2	1
	Path-202	Pathological bacteriology	2	1
	Path-203	Principle of human Immunology	3	1
	Path-204	Histopathological preparations	1	1
	Path-206	Medical Mycology	2	1
	Path-207	Medical human Virology	2	1
	Path-209	Animal tissue culture	2	1
	Path-210	Occupational laboratory safety	0	1
	Uni-260	Computer application	2	1
	Chem-200	Medical biochemistry	2	1
	Bio-200	Human physiology	3	1
	Uni-201	Human rights	3	0
Third	Path-301	Parasitic protozoa and helminths	3	1
	Path-302	Food and water pathogens	2	1
	Path-303	Clinical Immunology	2	1

	Path-304	Infectious diseases	2	1
	Path-305	Pathological biochemistry	2	1
	Path-306	Medical genetics	2	1
	Path-307	Medical molecular biology	2	1
	Path-308	Community health	2	0
	Path-309	General pathological analyses	0	1
	Bio-365	Medical entomology	2	1
	Uni-301	English language	2	0
	--	Un-compulsory courses	-	-
Fourth	Path-401	Blood diseases	2	1
	Path-402	Endocrinology	2	0
	Path-403	Serology and vaccines	2	1
	Path-404	Pathology	2	1
	Path-405	Forensics	2	1
	Path-406	Embryology	2	0
	Path-407	Bioinformatics	2	0
	Path-408	Research project	2	0
	Env-400	Environmental awareness	2	0
	--	Un-compulsory courses	-	-
Un-compulsory courses for third and fourth stages	Path-350	Antibiotics	2	1
	Path-351	Non-infectious diseases	2	1
	Path-450	Toxicology	2	1
	Path-451	Epidemiology	2	1
	Path-452	Diagnostic methods	2	1
	Path-453	Medical equipment technique	2	1
	Path-454	Biotechnology	2	1
	Path-455	Body fluids physiology	2	1
	Path-456	Quality control	2	1
	Path-458	Opportunistic parasites	2	1

8. Expected learning outcomes of the program

Knowledge

- * The ability to distinguish health problems and identify different types of pathogenic causes in various types of samples such as blood, urine, body fluids, etc.
- * The ability to find appropriate solutions to various diagnostic problems.
- * The ability to conduct field and laboratory measurements and tests with quality assurance, and to analyze results and interpret with scientific conclusions.

Skills

- * The ability to possess the necessary theoretical and practical skills to work in the academic, governmental, and industrial sectors and to provide advanced academic programs in the field of medical analysis.
- * Conducting field and laboratory scientific health research, diagnosing various microorganisms, identifying health problems, and encouraging research projects that address local and global health issues.
- * Contribute to sustainable health by raising the awareness of individuals and communities about the importance of early diagnosis through educational and awareness programs targeting various age and social groups, as well as developing educational curricula that focus on public health and its impact on daily life.
- * Work to solve health problems such as diagnosing infectious and chronic diseases, in cooperation with governmental bodies, ministries, and non-governmental organizations, and developing innovative solutions through research and field application.

Values

- * Possess ethical and professional responsibilities in various health issues.
- * Make appropriate health judgments and solutions while considering financial, societal, and global aspects.

Ethics

9. Teaching and Learning Strategies

- **Problem-based medical learning is part of the new teaching and learning strategy.**
- **The method is to divide students into groups, and each group is tasked with solving one of the diagnostic problems in the Iraqi or local environment. This will stimulate thinking and discussion, and each member of the group will have the task of thinking about a solution to this problem.**
- **Then they will discuss the results and present a report with a presentation of the results, analysis, interpretations, conclusions, and appropriate solutions to the problem.**

10. Assessment Methods

- * Daily, monthly, and final theoretical and practical exams.**
- * Project discussion.**
- * Seminars + reports.**
- * Summer training.**
- * Practical exams.**
- * Course grade 40%, final exam 60%.**
- * Grades are divided according to the approved teaching system, courses or path (Bologna and the number of units for each course, taking into account the presence or absence of a practical side (laboratory)).**

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Admission Criteria

*** Central distribution by the Ministry of Higher Education determines those accepted into the college.**

*** Students are distributed among the college's departments at the University of Basrah, which number 7 departments, where competition is based on the total score and on the basis of comparative subjects.**

*** The capacity plan for the Department of Medical Analysis last year was (60).**

13. Most Important Sources of Information about the Program

- * Department page on the college website / University of Basrah.**
- * Medical Analysis Department Guide.**
- * Ministry of Higher Education and Scientific Research website**

14. Program Development Plan

The development of the department depends on several criteria:

- * Using the latest scientific books.**
- * Continuous review of the planned and completed parts of the program, where the curriculum content is reviewed by the scientific committee.**
- * Developing future development plans through special committees for curricula, laboratories, and purchases.**
- * Encouraging cooperation and twinning with international universities and exchanging experiences and mutual visits**

Course Description Form Uni-103

1. Course name

Sport

2. Course code

Uni sci 103

3. Semester/Year

1/2025

4. Date this description was prepared

1/9/2025

5. Available forms of attendance

physical presence

6. Number of study hours (total) / Number of units (total)

2/2

7. Name of course administrator (if more than one name is mentioned)

Lafta hamed salman

8. Course objectives

Course objectives

Foundations and skills of sports activities

- Foundations, principles, rules, and laws of games
- Understanding the role of physical education, sports, and health activities

- **Creating a safe environment for the learner**
- **Components of physical, health, and motor fitness**
- **Designing educational activities**
- **Communicating sports information and skills and verifying educational and sports objectives**

9. Learning and teaching strategies

Strategy

Discussion, theoretical explanation, and education through projects and video presentations.

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
First	2	Basketball Laws	Basketball	Theoretical	
Second	2	Volleyball Laws	Volleyball	Theoretical	
Third	2	Football Laws	Football	Theoretical	
Fourth	2	Psychology	Psychology	Theoretical	
Fifth	2	Sports Injuries	Sports Injuries	Theoretical	
Sixth	2	Basketball Skills	Basketball	Practical	
Seventh	2	Volleyball Skills	Volleyball	Practical	
Eighth	2	Football Skills	Football	Practical	
Ninth	2	Physical Activity	Physical Activity	Theoretical	
Tenth	2	History of Sports	History of Sports	Theoretical	
Eleventh	2	Sports History Fitness	Fitness	Theoretical	

11. Course Evaluation

Daily exams - 10 marks

Attendance - 10

Report - 10

Practical exam - 10

Teaching time - 10

12. Learning and teaching references

Basketball	Basketball
Practical Basketball	Practical Basketball
Mental Health	Mental Health
Volleyball	

Psychology	
Fitness	

Course Description Form UOB 103

8. Course name : Computer Fundamentals

9. Course code : UOB103

10. Semester/Year 2026-2025

11. Date this description was prepared : 1-9-2025

12. Available forms of attendance : attendance / absence

13. Number of study hours (total) / Number of units (total): 4/ 3

14. Name of course administrator (if more than one name is mentioned)

Dr. Hanan R Alnjar

8. Course objectives

Course objectives

- To develop problem solving skills and understanding of Principle of Computer Science and its Programming.
- Introducing students to the computer and its hardware and software components and operating systems
- Teaching students to use the Windows operating system
- Teaching students to use application programs (Word, Excel, Access).

- Introducing students to the Internet, how to benefit from it, and what capabilities it offers in education and knowledge

9. Learning and teaching strategies

Strategy

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
Week1	2	Learn basic computer components	Computer Fundamentals	theoretically	
Week2	2	Learn basic computer components	Computer Fundamentals-1	theoretically	
Week3	2	Learn basic computer components	Computer Fundamentals-2	theoretically	
Week4	2	Learn basic computer components	Computer Fundamentals-3	theoretically	
Week5	1		Mid Exam	theoretically	
Week6	2	Learn computer working	Operating Systems and user interface Graphics	theoretically	
Week7	2	Learn computer working	Word processing	theoretically	
Week8	2	Learn computer working	sheet spread	theoretically	
Week9	2	Learn computer working	presentation software	theoretically	
Week10	2	Learn computer working	introduction to Internet	theoretically	

Week11	2	Learn computer working	introduction to AI	theoretically	
11. Course Evaluation					
12. Learning and teaching references					
2. Alan Evans, Kendall Martin, Mary Anne Poatsy, “Technology In Action Complete”, 16th Edition (2020).					
3. Ahmed Banafa, “Introduction to Artificial Intelligence (AI)”, 1st Edition (2024).					
4. 2016 "أساسيات الحاسوب" , الخضر علي الخضر بحث					
5. 2005 "مدخل إلى عالم الذكاء الاصطناعي" الدكتور عادل عبدالنور					

Course Description Form Chem-200

1. Course name
Medical Biochemistry
2. Course code
Chem-200
3. Semester/Year
Second/ Second

4. Date this description was prepared

2025/9/1

5. Available forms of attendance

theoretical and practice

6. Number of study hours (total) / Number of units (total)

3/30

7. Name of course administrator (if more than one name is mentioned)

Prof. Dr. Usama Hamid Ramadhan and Ms. Zainab Ali Abdullah

8. Course objectives**Course objectives**

- To introduce students to the field of medical biochemistry.
- To teach students about the biochemistry of the various components of the cell.
- To provide students with information about the types of molecules found in the cell.
- To familiarize students with the metabolism of different molecules in the human body.

9. Learning and teaching strategies**Strategy****10. Course structure**

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
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1	2		- Small molecules		
2	2	- Definition of biochemistry	- Large molecules		
3	2	- Carbohydrate chemistry			
4	2	- Carbohydrate metabolism	- Types of carbohydrates		
5	2	- Glycogen metabolism			
6	2	- Lipid chemistry	- Glycolysis		
7	2	- Understanding metabolism in the human body	- Glycogenolysis	theory and lab	question and answer quiz report exam
8	2	- Learning about the components of the human body	- Types of lipids		
9	2	- How enzymes work	- Cell membrane		
10	2		- Lipid metabolism		
11	2		- Amino acids		
12	2		- Proteins		
13	2		- Enzymes		
14	2		- Vitamins		
15	2				

11. Course Evaluation

Exam: 50 points, Quiz: 10 points, Report: 10 points, Participation: 10 points, Attendance: 10 points, Activity: 10 points.

12. Learning and teaching references

1	Harper's Illustrated Biochemistry, 32nd Edition Peter J. Kennelly, Kathleen M. Botham, Owen P. McGuinness, Victor W. Rodwell, P. Anthony Wei
2	Lippincott's Illustrated Reviews: Biochemistry". Philadelphia: Lippincott Williams & Wilkins, 2014. Textbook.

3	Lehninger Principles of Biochemistry (8th Edition) by David Nelson & Michael Cox

Course Description Form (UOB 203)

1. Course name : Computer 2
2. Course code: UOB 203
3. Semester/Year : 2026-2025
4. Date this description was prepared : 1-9-2025
5. Available forms of attendance: : attendance / absence
6. Number of study hours (total) / Number of units (total): 4/ 3
7. Name of course administrator (if more than one name is mentioned)
Dr. Hanan R Alnjar
8. Course objectives

Course objectives

- improving the student's level of using computers and thinking in solving problems
- using AI applications and tools
- Enable students to pass job interviews with regard to the specialization

9. Learning and teaching strategies

Strategy

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
Week1	2	Improve thinking in computer network	Introduction in Computer Networks	theoretically	
Week2	2	Improve thinking in computer network	Identify of network security	theoretically	
Week3	2	Cognitive thinking	Identify Electronic Commercial and online banking services	theoretically	
Week4	2	Cognitive thinking	Identify computer troubleshooting	theoretically	
Week5	2	Cognitive thinking	Introduction in Artificial Intelligence	theoretically	
Week6	2	Cognitive thinking	AI in our daily life	theoretically	
Week7	2	Cognitive thinking	monthly tests (exams):	theoretically	
Week8	2	Cognitive thinking	Applications of AI : part1	theoretically	
Week9	2	Cognitive thinking	Applications of AI : part2	theoretically	
Week10	2	Cognitive thinking	Applications of AI : part3	theoretically	
Week11	2	Cognitive thinking	AI and society	theoretically	

Week12	2	Cognitive thinking	Ethical challenges	theoretically	
Week13	2	Cognitive thinking	The future of AI	theoretically	

11. Course Evaluation

12. Learning and teaching references

1 – Cambridge IGCSE, Information and communication technologies 3^{ed} Edition, Graham Bill (2020).

2– Ahmed banafa, Introduction to Artificial Intelligence, 1st edituion (2024).

1- الدكتور عادل عبد النور . مدخل الى عالم الذكاء الاصطناعي (2005)

Course Description Form Path-204

1. Course name ; microscopic preparation

2. Course code PATH 204

3. Semester/Year :First Semester/Year 2025-2026

4. Date this description was prepared : September 18, 2025

5. Available forms of attendance : book and Computer

6. Number of study hours (total) / Number of units (total) 28

7. Name of course administrator (if more than one name is mentioned) Dr. Muslim Abdul Rahman Muhammad

8. Course objectives To teach students laboratory preparation methods for pathological analyses.

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Course objectives

To identify the advantages and disadvantages of laboratory materials and their suitability for analysis sample

- All smear preparation techniques and staining methods according to the diagnostic needs.
- Learning how to use laboratory examination devices, sectioning tools, and various types of microscopes, including the electron microscope.

9. Learning and teaching strategies

Strategy

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
1	2	General Preparation Methods:	Methods for Microscopic Preparations		
2-		Types of Microscopes	Learning to Use All Types of Microscopes		
3-		Light compound microscope	Using a Compound Light Microscope and its Parts		
4-		Smear	Learning blood, bacterial, and sputum smear techniques and proper handling methods.		
5-		Electron Microscope	Types and Preparation Methods		

6-		Cellular Division	Chromosome Sample Preparation Methods		
7-		Fixatives	. Types and Characteristics		
8-		Embedding Media	Uses and Specifications		
9-		Tissue Sectioning Methods	Types of embedding materials based on cutting speed and intended purpose.		
10		Exam			

11-		Measuring Microscopic Volumes and Magnification	Learning Methods for Measuring Microscopic Volumes and Magnification Power		
12-		Materials Used in Tissue Sectioning	Types of Embedding Materials Based on Cutting Speed and Purpose		
13-		Staining Methods	Using General and Special Stains		
14		Methods for Special Staining	Special Staining		

11. Course Evaluation

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12. Learning and teaching references

CARLTON TISSUE TECHNIQUE	
Research Sources: Textbooks, Published Journals, and Research Papers	
Practical Experiment	

Course Description Form Path-450

1. Course name

Toxicology

2. Course code

ت450

3. Semester/Year

2025-2026

4. Date this description was prepared

1\9\ 2025

5. Available forms of attendance

In person

6. Number of study hours (total) / Number of units (total)3

2\30

7. Name of course administrator

Asst. Prof. Dr. Rajaa N. Alyassein

8. Course objectives

- Students will explore the differences between man-made and natural toxic substances.
- Students will learn the basics of the dose-response principle and obtain information they can use in the future to make wise decisions for themselves and their families.
- Students will learn that toxic substances in our environment can affect all organisms.

- Students will understand that we are surrounded by both natural and manmade toxic substances and be able to differentiate between the two.
- Students will be able to define a “toxic substance.”
- Students will analyze toxicological risks versus benefits with the understanding of basic toxicological principles.
- Students will be able to calculate chemical concentrations in water.
- Students will understand the dose-response principle.

9. Learning and teaching strategies

Type something like: The main strategy that will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by Participate in discussion, Perform research and perform presentations about toxicology topics.

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
1	2		-Introduction to Toxicology,		Exam. The grade from 40 The final from 60 Total= 100
2	2		historical basic of toxicity.		
3	2		- What are harmful or adverse effects of toxicants?		
4	2		- Interaction of chemical toxicity types.		
5	2				
6	2				
7	2				
8	2				
9	2		-Toxicity Laws,		
10	2		Level of Toxicology effect, chemical basic of toxicology		
11	2				
12	2				
13	2		-Mechanisms of toxic Chemicals uptake, Factors - Affecting Dose and Response.		
14	2				

			-Calculations of Lt50 LC50, LD50, EC50 and ED5. -Factors relating to the exposure and organisms and Pathways of Exposure -Toxicity of chlorine: How people can be exposed to chlorine, Symptoms of chlorine poisoning -Toxicity of heavy metals on human health and Immune Response. -Toxicity of different types pesticides and their effects on human health. -Toxicity of Flame retardants poisoning, and Human pathways exposure. -Toxicity of pharmaceuticals and personal care products. -Toxicity of antimicrobial Risk Assessment of toxic substance -Review sessions for all lectures. Preparatory week before the final Exam		
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11. Course Evaluation

Theoretical tests, Quiz , Presentation, Homework and Oral test

12. Learning and teaching references

Required Texts:

Gallo, M. A., & Doull, J. (1996). History and scope of toxicology.

Borzelleca, J. F. (2000). Paracelsus: herald of modern toxicology. *Toxicological Sciences*, 53(1), 2-4.

Al-Tohamy, R., Ali, S. S., Li, F., Okasha, K. M., Mahmoud, Y. A. G., Elsamahy, T., & Sun, J. (2022). A critical review on the treatment of dye-containing wastewater: Ecotoxicological and health concerns of textile dyes and possible remediation approaches for environmental safety. *Ecotoxicology and environmental safety*, 231, 113160.

Recommended Texts:

Robertson, D. G. (2005). Metabonomics in toxicology: a review. *Toxicological Sciences*, 85(2), 809-822.

Gupta, P. K. (2014). Essential concepts in toxicology. *Journal of Drug Delivery and Therapeutics*, 4(2), 00-00.

Websites:

<https://www.toxicology.org/about/relevance.asp?>

Course Description Form Path-206

8. Course name

Medical mycology

9. Course code

Path206

10. Semester/Year

2nd 2025/2026

11. Date this description was prepared

2025/9/1

12. Available forms of attendance**13. Number of study hours (total) / Number of units (total)**

2h/ lecture

14. Name of course administrator (if more than one name is mentioned)

Assist Prof Dr Ayat Al-laeiby

8. Course objectives**Course objectives**

Review and description of various fungal diseases, enhanced with figures and illustrations to facilitate clinical diagnosis.

- developing students' skills in isolation and diagnosis fungal pathogens in the laboratory, through the use of different methods and technologies.
- Theoretical and practical preparation of students, and raising their competencies in order to assume responsibility, whether in pathological analyses, or other fields related to medical mycology.

9. Learning and teaching strategies**Strategy**

The main strategy that will be adopted in delivering this module is to aid students to understand the general concept of this model through:

1. interactive tutorials.
2. Brain storm.
3. Understanding the importance and applications of this field of science through discussion.

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
1.			Introduction to medical mycology		
2.			General characteristics and classification of fungi		
3.			Primary & opportunistic fungal pathogens Susceptibility to these pathogens and determinants of Pathogenicity		
4.			Source of infection and mode of transmission. classification of human mycoses		
5.			Superficial mycoses		

6.			Mid		
7.			Cutaneous mycoses		
8.			Systemic opportunistic mycoses: candidiasis		
9.			Cryptococcosis		
10.			Aspergillosis		
11.			Mucormycoses		

12.			Fusarium mycosis, Pseudallescheria / Scedosporium mycosis		
13.			Phaeohyphomycoses		
14.			Pneumocystomycosis		
15.			Systemic mycoses caused by dimorphic fungi (Endemic mycoses)		
16.			Virulence factors		
17.					

11. Course Evaluation

Exam, quiz, students cooperations

12. Learning and teaching references

Medical mycology

Course Description Form Path-301

1. Course name ; Medical Parasitology

2. Course code PATH 301

3. Semester/Year :second Semester/Year 2025-2026

4. Date this description was prepared :2025 /9 /1

5. Available forms of attendance : Attendance Lists & Computer

6. Number of study hours (total) / Number of units (total) 32

7. Name of course administrator (if more than one name is mentioned) Dr. Muslim Abdul Rahman Muhammad and Lecturer Ola Abdul-Shaheed

8. Course objectives To teach students laboratory preparation methods for pathological analyses.

Course objectives

The course aims to teach students laboratory preparation methods for pathological analyses, with a focus on:

Identifying intestinal, blood, and tissue parasites, including protozoa, nematodes, cestodes, and trematodes.

Gaining hands-on experience in diagnosing parasites using conventional techniques and staining methods

9. Learning and teaching strategies

Strategy

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
1	3	Protozoa Identification	Types of Parasitism /	Theory + Practical	Monthly Exam / Quiz / Report / Practical Exam

2-	3	Intestinal Protozoa	Amoebae	Theory + Practical	
3-	3	Intestinal Protozoa)	Mastigophora (Flagellates	Theory + Practical	
4-	3	Blood Protozoa	<i>Leishmania</i>	Theory + Practical	
4-	3	Blood Protozoa	<i>Trypanosoma</i>	Theory + Practical	
6-		Trematodes	<i>Schistosoma</i>	Theory + Practical	

7-		Trematodes	<i>Fasciola</i>	Theory + Practical	
8-		Cestodes	Hydatid Cysts	Theory + Practical	
9-		Cestodes	<i>Taenia saginata & Taenia solium</i>	Theory + Practical	
10		Cestodes	Fish Tapeworm	Theory + Practical	
11-		Exam Theory + Practical			

12-		Nematodes	Ascaris & Ancylostoma	Theory + Practical	
13-		Nematodes	Enterobius & Trichinella	Theory + Practical	
14		Methods for Special Staining	Special Staining		
		Nematodes	Filariasis	Theory + Practical	
		Sporozoa	<i>Cryptosporidium</i> & <i>Cyclospora</i>	Theory + Practic	

11. Course Evaluation \ Lectures (Theoretical)
Laboratory Sessions (Practical)
Reports
Quizzes
Monthly Exams
Final Practical and Theoretical Exams

12. Learning and teaching references

Foundations of Parasitology

Research Sources

Practical Experiment

Medical Parasitology

Course Description Form Path 302

1. Course name :

Water and food microbiology

2. Course code :

path 302

3. Semester/Year:

2025-2026

4. Date this description was prepared : Sep.2025

1 Sep.2025

5. Available forms of attendance :

Two lecture per week and 3 group of lab

6. Number of study hours (total) / Number of units (total)

Number of study hours (200) / Number of units (3)

7. Name of course administrator (if more than one name is mentioned)

Pro.Dr.Saad Shakir Mahdi Al-Amara

8. Course objectives

Course objectives

- 1.To develop problem solving skills and understanding food borne diseases .
- 2.To understand how microorganism spoil food .
- 3.This course deals with the water borne diseases
- 4.To understand the methods of preserving food .

9. Learning and teaching strategies

Strategy

1. Recognize how food transmit diseases.
 2. List the various terms associated food microbiology.
 3. Summarize the relation between food and infection .
 4. Describe how does food spoiled by microorganisms .
 5. Explain methods of food preservation .
 6. Identify the diversity and habitats of microorganisms .
- Describe methods of transmission of diseases from water to human beings

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
First	3	Knowledge	Scope of food microbiology and historical development of food microbiology.	Using charts and display screens	Daily Quiz and Discussion with Students
Second	3	Knowledge	Microorganism and food (Food spoilage/Preservation, Microbial quality assurance, diversity of habitat)	Using charts and display screens	Daily Quiz and Discussion with Students
Third	3	Knowledge	Factors Affecting the Growth and Survival	Using charts and display screens	Daily Quiz and

			of Micro-organisms in Foods		Discussion with Students
Fourth	3	Knowledge	food spoilage	Using charts and display screens	Daily Quiz and Discussion with Students
Fifth	3	Knowledge	Food spoilage (meat ,fish and eggs)	Using charts and display screens	Questions and Report Preparation
Sixth	3	Knowledge	Food spoilage (spoilage of flour and bakery)	Using charts and display screens	Daily Quiz and Discussion with Students
Seventh					First month exam
Eighth	3	Knowledge	Food spoilage (canned food)	Using charts and display screens	Daily Quotient and Discussion with Students
Ninth	3	Knowledge	food borne diseases part 1	Using charts and display screens	Daily Quotient
Tenth	3	Knowledge	food borne diseases part 2	Using charts and display screens	Questions and Report Preparation
Eleventh	3	Knowledge	food toxicity(endo and exo toxin producing bacteria)	Using charts and display screens	Daily Quotient and Discussion with Students
Twelfth	3	Knowledge	food toxicity (fungal toxin)	Using charts and display screens	Daily Quotient and Discussion with Students
Thirteenth	3	Knowledge	water borne diseases part 1	Using charts and display screens	Daily Quotient and Discussion with Students
Fourteenth	3	Knowledge	food preservation	Using charts and display screens	Questions and Report Preparation
Fifteenth					Second month exam

11. Course Evaluation

Through reports and discussions with the student, in addition to daily assignments and monthly exams.

12. Learning and teaching references

Modern Food Microbiology, Sixth Edition, by James M. Jay Professor Emeritus Wayne State University Detroit, Michigan Adjunct Professor, 2000

Practical Food Microbiology, 3rd Edition, by Diane Roberts, Melody Greenwood, 2008

Course Description Form Path-305

8. Course name

Clinical Chemistry

9. Course code

Path 305

10. Semester/Year

First semester/third year 2025/2026

11. Date this description was prepared

1/09/2025

12. Available forms of attendance

1: In-Person Attendance

• Attending lectures and laboratory sessions physically on campus

2 :Online Attendance .

Participating in classes through virtual platforms (such as Google Classroom, Moodle, or Zoom), when remote learning is allowed or required

3:Hybrid Attendance .

• A combination of in-person and online learning, depending on the course schedule or institutional policy

Note: The available attendance mode depends on the college's regulations and general circumstances (e.g., public health conditions or technical infrastructure).

13. Number of study hours (total) / Number of units (total)**4 hours/3 units****14. Name of course administrator (if more than one name is mentioned)****Haider Abdul-Kareem Mohammad****8. Course objectives****Course objectives**

- 1. Understand the biochemical principles related to the functions of body organs and analyze them in the laboratory.
- 2. Acquire skills in interpreting chemical test results for diagnosis and disease monitoring.
- 3. Learn about clinical chemistry analysis techniques and instruments such as enzyme analyzers, electrolytes, and hormone analyzers

9. Learning and teaching strategies**Strategy**

The aim is to enable the student to understand both theoretical concepts and practical applications. It can be summarized as follows:

1. Interactive theoretical lectures:
 - Explanation of fundamental concepts and biochemical processes related to clinical chemistry.
 - Linking theoretical content with real clinical cases.
2. Practical laboratory training:
 - Performing chemical analyses on blood, urine, and other body fluid samples.
 - Utilizing analytical instruments such as autoanalyzers and devices for enzyme and electrolyte measurement.
3. Presentations and case studies:
 - Analyzing real clinical cases and correlating them with laboratory findings.
 - Enhancing critical thinking and clinical reasoning skills.

10. Course structure**Week****Hours****Required educational outcomes****Name of unit or topic****Learning method****Evaluation method**

15	45	1. Knowledge and Understanding: - The student should explain the basic principles of clinical chemistry and its tests. - The student should differentiate between various tests used to evaluate organ functions (e.g., liver, kidney, glands). 2. Practical Skills: - The student should accurately perform basic chemical analyses in the laboratory. - The student should use modern laboratory equipment such as enzyme analyzers and autoanalyzers. 3. Analysis and Interpretation: - The student should interpret chemical test results and correlate them with clinical conditions. - The student should assess biochemical changes resulting from different diseases. 4. Communication and Teamwork: - The student should present results clearly and scientifically. - The student should work effectively within a laboratory team and apply professional safety standards.	1. CHO disorder 2. Lipid disorder 3. Liver disorder 4. Enzymology 5. Renal disorder 6. Protein disorder 7. Acid base balance 8. Calcium disorder 9. Tumour marker 10. Endocrinology	Learning Methodology for Clinical Chemistry Course relies on integrating theoretical and practical aspects and includes: 1. Theoretical Lectures: - Explanation of fundamental concepts, enzymes, metabolism, chemical analyses, and organ functions. - Use of presentations and clinical examples to link theory with practice. 2. Practical Laboratory Training: - Training students to perform chemical tests (e.g., glucose, urea, creatinine, enzymes assays). - Utilizing modern instruments and learning analysis procedures and quality control. 3. Problem-Based Learning (PBL): - Presenting clinical cases	Evaluation Method for Clinical Chemistry Course typically covers both theoretical and practical aspects, including: 1. Theoretical Exams (60%): - Multiple-choice questions, short essays, and case-based analytical interpretation. - Assessing theoretical understanding and scientific reasoning. 2. Practical Exams (20%): - Student performance in the lab, execution of tests, instrument handling, and result accuracy.
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				linked to laboratory tests to stimulate clinical reasoning. 4. Group Discussions and Presentations: - Enhancing teamwork and communication skills through project presentations and result analysis. 5. Continuous Assessment (Practical and Theoretical Exams): - Monitoring learning progress and providing ongoing feedback to improve performance.	3. Class Participation and Assignments (10%): - Attendance, in-class engagement, and submission of lab reports and homework. 4. Presentations or Projects (10%): - Clinical case presentations or scientific reviews related to clinical chemistry.
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11. Course Evaluation

A core subject designed to link biochemical concepts with clinical applications for the diagnosis and monitoring of diseases. It is evaluated through a combination of theoretical and practical exams, as well as classroom and research activities that enhance the student's understanding of the diagnostic role of medical laboratories.

12. Learning and teaching references

Clinical_Chemistry_by_William_Marshall,_Márta_Lapsley,_Andrew_Day	
Clinical Biochemistry - Gaw	
Clinical chemistry and metabolic medicine, Crook (Text book)	
Clinical_Chemistry_by_William_Marshall,_Márta_Lapsley,_Andrew_Day	

Course Description Form Path-307

1. Course name medical molecular biology

2. Course code path 307

3. Semester/Year2025-2026

4. Date this description was prepared2025 -9-1

5. Available forms of attendance lectures

6. Number of study hours (total) / Number of units (total) 125

7. Name of course administrator (if more than one name is mentioned)

Dr. Afrodet Abdulrazzaq Saleh

8. Course objectives

Course objectives

- To develop problem solving skills and understanding of Principle of molecular biology
- 2. Introducing students to the molecular biology
- 3. Teaching students to learn the genetic molecules like DNA , RNA and proteins
- 4. Teaching students to use different experimental labs for extraction and purification of genetic molecules.

9. Learning and teaching strategies

Strategy	Skills for communications with scientific behavior for students and learning the experiments dealing with extraction, purification and detection of DNA, RNA and proteins.
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10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
1	2		Introduction to molecular biology		
2	2		Cell biology		
3	2		:Introduction		
4	2		What is nucleic acid?		
5	2		Properties of nucleic acids		
6	2		Types of nucleic acids		
7	2		Prokaryotic chromosome		
8	2		Eukaryotic chromosome		
9	2		Mid exam.		
10	2		DNA replication		
11	2		Protein and amino acids		
12	2		Polymerase chain reaction		
13	2		DNA transcription		
14	2		DNA translation		
			Gel electrophoresis		
			Preparatory week before the final Exam		

11. Course Evaluation

100 marks

12. Learning and teaching references

Molecular Biology. P.C. Turner, A.G. McLennan, A.D.	
Bates & M.R.H. White.School of Biological Sciences,	

Course Description Form Path-352

1. Course name

Nanotechnology Applications in Pathological Analysis

2. Course code

Path-352

3. Semester/Year

First and second term/ 2026-2025

4. Date this description was prepared

1/9/2025

5. Available forms of attendance

Lectures and Labs

6. Number of study hours (total) / Number of units (total)

3

7. Name of course administrator (if more than one name is mentioned)

Dr. Hanaa Radhi Jolan

8. Course objectives**Course objectives**

- To develop problem solving skills and understanding of nanoscience and nanotechnology theory through the application of techniques in Pathological analysis.
- To understand nanoscales measurements, Nanoparticles and nanomaterials, and their applications.
- This course deals with the basic concept of nanoscience and applications nanotechnology in Pathological analysis.

- This is the basic subject for all types of nanoparticles and their applications.
- To understand the behavior nanomaterials at nanoscales, and how they differ from their bulk materials.
- To perform the strategies that is used by nanotechnology to manifestation analytical pathogenic to treat the human diseases.

9. Learning and teaching strategies

Strategy

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
1	2	Understanding the concept of nanoscience and nanoatechnology	Introduction to Nanoscience and nanotechnology	Data show slides and research papers	Quizzes and writing homework
2	2	To identify and classify types of nanoparticles	Classification of nanoparticles	Data show slides and research papers and lab work	Quizzes and writing homework
3	2	To Synthesis of Nanomaterials	Synthesis of Nanomaterials	Data show slides and research papers and lab work	Presentation assignments
4	2	To explore the methods of characterization nanoparticles	Characterization of nanoparticles	Data show slides and research papers	Writing short paper

5	2	To discover the nanoparticles properties	Nanoparticles properties	Data show slides and research papers	Presentation preparation
6		To study the applications of nanoparticles-	Applications of nanoparticles-	Data show slides and research papers	Reading research articles

11. Course Evaluation

Testes and Quizzes

Formative assessment	Quizzes	2	10% (10)
	Assignments	2	10% (10)
	Projects / Lab.	1	10% (10)
	Report	1	10% (10)
Summative assessment	Midterm Exam	2hr	10% (10)
	Final Exam	3hr	50% (50)
Total assessment			100% (100 Marks)

12. Learning and teaching references

Introduction to Nanoscience and Nanotechnology "Introduction to Nanotechnology" by Poole C P and Owens F J, and Scientific research articles	

1. Course name :	
Microbial physiology	
2. Course code :	
path 353	
3. Semester/Year:	
2025-2026	
4. Date this description was prepared : Sep.2025	
1 Sep.2025	
5. Available forms of attendance :	
one lecture per week	
6. Number of study hours (total) / Number of units (total)	
Number of study hours (125) / Number of units (3)	
7. Name of course administrator (if more than one name is mentioned)	
Pro.Dr.Saad Shakir Mahdi Al-Amara	
8. Course objectives	
Course objectives	Providing students with basic information on the subject of microscopic physiology and the relationship of the subject to topics related to diagnosis, identification and diagnosis of microorganisms through the physiological activities carried out by microorganisms, and also explaining to students the importance of knowing the factors that determine their presence and how to diagnose using the tests used to distinguish between different types of bacteria .
9. Learning and teaching strategies	

Strategy	Using educational methods to present the topic through interactive lectures, PowerPoint presentations, diagrams, and discussion with students to explain the idea in a simple, objective, and scientific manner that makes it easy for the student to understand.
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10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
First	3	Knowledge	-Physiology of prokaryotic cell surface .	Using charts and display screens	Daily Quiz and Discussion with Students
Second	3	Knowledge	-Teichoic acids (TAs) structure and function. -Lipoteichoic acids (LTAs) structure and function .	Using charts and display screens	Daily Quiz and Discussion with Students
Third	3	Knowledge	-Structure and physiology of lipopolysaccharides	Using charts and display screens	Daily Quiz and Discussion with Students
Fourth	3	Knowledge	-The metabolism of microbes	Using charts and display screens	Daily Quiz and Discussion with Students
Fifth	3	Knowledge	-Classification of enzyme function .	Using charts and display screens	Questions and Report Preparation
Sixth	3	Knowledge	-Metabolic pathways for enzymes.	Using charts and display screens	Daily Quiz and Discussion with Students
Seventh					First month exam
Eighth	3	Knowledge	-Energy in cells.	Using charts and display screens	Daily Quotient and Discussion with Students
Ninth	3	Knowledge	-Amino acid family through tri-carboxylic acid cycle	Using charts and display screens	Daily Quotient
Tenth	3	Knowledge	-Electron transport and oxidative phosphorylation	Using charts and display screens	Questions and Report Preparation

Eleventh	3	Knowledge	-Anaerobic respiration	Using charts and display screens	Daily Quotient and Discussion with Students
Twelfth	3	Knowledge	-Environmental factors that influence microbes	Using charts and display screens	Daily Quotient and Discussion with Students
Thirteenth	3	Knowledge	-Genetic and genes unlocking the secrets of physiology	Using charts and display screens	Daily Quotient and Discussion with Students
Fourteenth	3	Knowledge	-The major participants in transcription and translation	Using charts and display screens	Questions and Report Preparation
Fifteenth					Second month exam

11. Course Evaluation

Through reports and discussions with the student, in addition to daily assignments and monthly exams.

12. Learning and teaching references

Microbial Physiology , 3rd Edition ,by Albert G. Moat , John W. Foster 2017

Microbial Physiology, 4th Edition, by Albert G. Moat , John W. Foster , Michael P. Spector ,2003

Course Description Form Path-450

1. Course name

Toxicology

2. Course code

Path-450

3. Semester/Year**2025-2026****4. Date this description was prepared****1\9\ 2025****5. Available forms of attendance****In person****6. Number of study hours (total) / Number of units (total)3****2\30****7. Name of course administrator****Asst. Prof. Dr. Rajaa N. Alyassein****8. Course objectives**

- Students will explore the differences between man-made and natural toxic substances.
- Students will learn the basics of the dose-response principle and obtain information they can use in the future to make wise decisions for themselves and their families.
- Students will learn that toxic substances in our environment can affect all organisms.
- Students will understand that we are surrounded by both natural and manmade toxic substances and be able to differentiate between the two.
- Students will be able to define a “toxic substance.”
- Students will analyze toxicological risks versus benefits with the understanding of basic toxicological principles.
- Students will be able to calculate chemical concentrations in water.

- Students will understand the dose-response principle.

9. Learning and teaching strategies

Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by Participate in discussion, Perform research and perform presentations about toxicology topics.

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
1	2		-Introduction to Toxicology, historical basic of toxicity.		الامتحانات The grade from 40 The final from 60 Total= 100
2	2		- What are harmful or adverse effects of toxicants?		
3	2		- Interaction of chemical toxicity types.		
4	2		-Toxicity Laws, Level of Toxicology effect, chemical basic of toxicology		
5	2		-Mechanisms of toxic Chemicals uptake, Factors - Affecting Dose and Response.		
6	2		-Calculations of Lt50 LC50, LD50, EC50 and ED5.		
7	2		-Factors relating to the exposure and organisms and Pathways of Exposure		
8	2				
9	2		-Toxicity of chlorine: How		

10	2		people can be exposed to chlorine, Symptoms of chlorine poisoning		
11	2		-Toxicity of heavy metals on human health and Immune Response.		
12	2		-Toxicity of different types pesticides and their effects on human health.		
13	2		-Toxicity of Flame retardants poisoning, and Human pathways exposure.		
14	2		-Toxicity of pharmaceuticals and personal care products.		
15	2		-Toxicity of antimicrobial Risk Assessment of toxic substance -Review sessions for all lectures. Preparatory week before the final Exam		

11. Course Evaluation

Theoretical tests, Quiz , Presentation, Homework and Oral test

12. Learning and teaching references

Required Texts:

Gallo, M. A., & Doull, J. (1996). History and scope of toxicology.

Borzelleca, J. F. (2000). Paracelsus: herald of modern toxicology. Toxicological Sciences, 53(1), 2-4.

Al-Tohamy, R., Ali, S. S., Li, F., Okasha, K. M., Mahmoud, Y. A. G., Elsamahy, T., & Sun, J. (2022). A critical review on the treatment of dye-containing wastewater: Ecotoxicological and health concerns of textile dyes and possible remediation approaches for environmental safety. Ecotoxicology and environmental safety, 231, 113160.	
Recommended Texts: Robertson, D. G. (2005). Metabonomics in toxicology: a review. Toxicological Sciences, 85(2), 809-822. Gupta, P. K. (2014). Essential concepts in toxicology. Journal of Drug Delivery and Therapeutics, 4(2), 00-00.	
Websites: https://www.toxicology.org/about/relevance.asp?	

Model Description Path-453

1. Course Title: Laboratory Instrumentation Techniques
2. Course Code: Path 453
3. Semester/Year : 2026-2025
first / fourth
4. Date this description was created: 1/9/2025

5. Available Forms of Attendance : Available

6. Number of Hours (Total) / Number of Units (Total): 30/3

7. Name of the course administrator (if more than one name is mentioned) / Prof. Dr. Ikhlas Qanbar Jassim

8. Course Objectives

1. Course Objectives

- 1. Introduce the student to the basic principles of modern laboratory devices and their mechanism of operation.**
- 2. Develop practical skills in the operation and maintenance of laboratory equipment used in chemical, biological, and clinical analysis.**
- 3. Providing the ability to interpret the results provided by the devices and link them to scientific and practical applications.**
- 4. Qualify the student to deal with technical problems such as measurement errors or minor hardware malfunctions.**
- 5. Promote a culture of quality and safety in handling devices within laboratories.**
- 6. Learn about the components of laboratory instruments (electrical, optical, mechanical parts).**
- 7. They are the physical and chemical principles of the functioning of devices (absorption, emission,**

	diffraction of light, electricity, etc.). 8. Training in quantitative and qualitative analysis instruments such as: 9. Spectrophotometer 10. Chromatography of all kinds 11. Electrophoresis 12. Centrifuge 13. Ability to choose the right device for the required analysis. 14. Apply calibration methods and adjust devices for accurate results. 15. Write practical reports that include the extracted data and their statistical analysis.
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9. Learning and teaching strategies

Strategy	1. Interactive Theoretical Lectures a. To explain the physical and chemical principles that underpin devices. b. Integrate discussion style and ask questions to stimulate critical thinking. 2. Hands-on in the lab a. Direct application to devices (operation, calibration, simple maintenance). b. Divide students into small groups to increase participation. 3. Demonstrations a. The teacher operates the device in front of the students and then assigns them to the individual or group application. 4. Problem-Based Learning a. Give scenarios like, "The device is not giving a correct reading, what's the reason?"
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	and let the students deduce the solution. 5. Mini-Projects and Reports - Write laboratory reports on the use of a particular device or compare results between two devices. - Make presentations on a specific technique. 6. Use of multimedia - Educational videos, simulation software, illustrations for easy understanding. 7. Continuous Calendar - Short questions during the lecture (Quiz). Hands-on live assessment during the operation of the devices.
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10. Course Structure

Evaluation Method	Learning method	Unit or Subject Name	Required Learning Outcomes	Hours	The week
Exams 70 degree Practical 30 Total Grade 100	1. Learning by Theoretical Lectures	Introduction to Laboratory Instrumentation Technologies - The importance of instrumentation in chemical and biological analysis. - General rules for occupational safety. Physical and chemical principles of the operation of devices - Absorption, emission, refraction, diffraction, electricity. Spectroscopic Techniques - Photoabsorber (UV-Vis).	First: Knowledge Outcomes		
	○ To clarify the basic principles of the operation of the devices.		The student should know the basic principles of the work of laboratory equipment.	2	1
	○ Use PowerPoint slides and illustrations.		Explain the mechanism of action of the most important analytical devices (e.g. spectrophotograph, chromatography, centrifuge).	2	2
	2. Hands-on Training		Distinguish between the types of devices and their uses in different analyses.	2	3
	○ Perform experiments directly on devices.		Describe the steps for calibration and tuning of the instruments for accurate results.	2	4
	○ Divide students into small groups to apply operation and calibration.			2	5
	3. Demonstration			2	6
	○ Demonstrating the operation			2	7
				2	8
				2	9
				2	10
				2	11
				2	12
				2	13
				2	14
				2	15
			Second: Skills Outcomes		
			The student must operate the basic		

	of the device in front of the students and then training them on the same steps. 4. Collaborative Learning - Working in groups on reports or mini-projects. - Exchange of roles between students (operation, monitoring, recording of results). 5. Problem-Based Learning - Discuss real-world issues such as hardware failures or inaccurate results. 6. Self-Learning - Assigning students to research new technologies for devices. - Read articles or manuals and then view them. 7. Use of Multimedia Learning - Educational videos, simulations . 8. Reporting and Presentations - Write accurate scientific laboratory reports. - Giving short presentations	- Atomic Absorber (AAS). - Fluorescence devices. Separation Techniques - Paper and thin-layer chromatography (TLC). - Invasive chromatography (GC). - High Efficiency Liquid Chromatography (HPLC). Electrophoresis techniques - Principles and Applications. - Devices used. Centrifuges - Types and Uses. - Applications in Microbiology and Biochemistry. Physical Properties Measurement Devices - pH meter. Calibration and Maintenance - Calibration steps. - Regular maintenance of equipment. Practical Applications and Laboratory Reports - Device operation and data extraction. - Preparation of scientific practical reports. Hematology Analyzer Glucose Analyzer	laboratory equipment efficiently and safely. Apply simple maintenance steps and address operational errors. Analyze laboratory results and compare them with reference values. Document data in practical reports using a structured scientific method. Third: Attitudinal Outcomes The student must adhere to the rules of occupational safety while using the devices. Demonstrate accuracy and attention to detail when taking measurements and experiments. He should work in a team spirit and collaborate with his colleagues in completing experiments. Commit to academic work ethics (honesty .(in results and reports		
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	to colleagues to enhance communication skills.				
11. Course Evaluation					
Theoretical tests, project discussion, practical tests					
12. Learning and Teaching Resources					
Scientific Devices and Laboratory Techniques – Author: Dr. Abdullah Abdel Rahman.					
Methods of Machine Analysis – Author: Dr. Zainab Hassan, Dar Al-Marrekh Publishing.					
Machine Analysis: Foundations and Applications – Dr. Mohamed Magdy Al-Wakil.					
Principles of Instrumentation and Laboratory Analysis – King Saud University (Educational Memorandum).					

Course Description Form Path-454

1. Course name Biotechnology
2. Course code: Path-454
3. Semester/Year 2025-2026
4. Date this description was prepared 2025-9-1

5. Available forms of attendance lectures

6. Number of study hours (total) / Number of units (total) 28 - 3

7. Name of course administrator (if more than one name is mentioned)

Dr. Afrodet Abdulrazzaq Saleh

8. Course objectives

Course objectives

- Introducing students to the concept of biotechnology
- Teaching students the types of biotechnology
- Teaching students the applications of biotechnology
-

9. Learning and teaching strategies

Strategy

Skills for communications with scientific behavior for students and learning the experiments dealing with extraction, purification and detection of DNA, RNA and proteins.

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
1	2		Introduction and Historical of biotechnology		
2	2		Types of biotechnology		
3	2		Applications of biotechnology		
4	2		comparison between molecular and biotechnology		
5	2		Mid exam 1		
6	2		DNA cloning		
7	2		cell culture		
8	2				
9	2				

10	2		Recombinant of biotechnology : concept		
11	2		Cloning vectors		
12	2		Methods of recombinant dna technology		
13	2		Requirements		
14			Genetic engineering		
			purification of proteins		
			Gene therapy		
			Final exam		

11. Course Evaluation

100 marks

12. Learning and teaching references

<i>Pharmaceutical Biotechnology” by S P Vyas</i>	
<i>hekol C, Gebreyohannes M. Application and Current Trends of Biotechnology: a Brief Review. Austin Journal of Biotechnology & Bioengineering, 2018;5(1):1-8</i>	

Course Description Form Path-457

1. Course name
Genetic engineering
2. Course code
Path457
3. Semester/Year

4th 2025/2026

4. Date this description was prepared

2025/9/1

5. Available forms of attendance

attendance

6. Number of study hours (total) / Number of units (total)

3 / 45

7. Name of course administrator (if more than one name is mentioned)

Assist Prof Dr Ayat Al-laeiby

8. Course objectives

Course objectives

1. Understanding the principles of genetic engineering and its applications.
2. Graduate students have good knowledge of genetic engineering

9. Learning and teaching strategies

Strategy

The main strategy that will be adopted in delivering this module is to aid students to understand the general concept of this model through:

1. interactive tutorials.
2. Brain storm.
3. Understanding the importance and applications of this field of science through discussion

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
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1.			Introduction and Historical of biotechnology		
2.			Types of biotechnology		
3.			Applications of biotechnology		
4.			comparison between molecular and biotechnology		
5.			Mid exam 1		
6.			DNA cloning		

7.			cell culture		
8.			Recombinant of biotechnology : concept		
9.			Cloning vectors		
10.			Methods of recombinant dna technology		
11.			Requirements		
12.			Genetic engineering		

13.			purification of proteins		
14.			Gene therapy		
15.			Preparatory week before the final Exam		

11. Course Evaluation

Exam, quiz, students contributions

12. Learning and teaching references

Uluçay, O., & Koç, N. (2023). Genetic Engineering and Biotechnology: An Overview of The Principles That Define Genetic Engineering. In A Akpınar (Ed.), <i>Research on Mathematics and Science- II</i> (pp. 55–66). Özgür Publications.	Brandenberg, O., Dhlamini, Z., Sensi, A., Ghosh, K., & Sonnino, A. (2011). <i>Introduction to molecular biology and genetic engineering</i>. Food and Agriculture organization of the united Nations.
Brown, T. (1999). Southern blotting and related DNA detection techniques. In <i>ENCYCLOPEDIA OF LIFE SCIENCES</i> (pp. 1–6). Nature Publishing Group	
Brown, T. (2010). <i>Gene cloning and DNA analysis: An introduction</i> (6th ed.).	

Principles and applications of Polymerase Chain Reaction in medical diagnostic fields: A review	

Course Description Form

8. Course name :- Non infectious disease

9. Course code:- Path 304

10. Semester/Year:- 1st semester 2025/2026

11. Date this description was prepared:- 2025/9/1

12. Available forms of attendance:- Attendance

13. Number of study hours (total) / Number of units (total): 2/30

14. Name of course administrator (if more than one name is mentioned)

Assist Prof. Dr. Zainab Radhi Abdul-Hussein

8. Course objectives

Course objectives

1. Basic Knowledge: Understanding the nature of disease-causing microbes (bacteria,

		viruses, etc.) and how they spread and cause disease. 2. Diagnosis: Learning the skills to identify the symptoms of infectious diseases and to select and interpret appropriate laboratory tests. 3. Treatment: Knowing the principles of using antimicrobial drugs and dealing with the problem of drug resistance. 4. Prevention: Methods of infection control within hospitals and applying prevention strategies (such as vaccination) in the community. 5. Public Health: Understanding how to track and investigate outbreaks and protect public health on a large scale. 6. Safety: Protecting against infection with an ethical and professional framework.	
9. Learning and teaching strategies			
Strategy		1. Interactive Theoretical Lectures a. To explain the physical and chemical principles underlying the devices. b. Integrating discussion and questioning techniques to stimulate critical thinking. 2. Demonstrations a. The instructor operates the device in front of the students, then assigns them to apply the knowledge individually or in groups. 3. Problem-Based Learning (PBL) a. Providing scenarios such as: "Presenting cases of disease outbreaks and how to treat and prevent them." 4. Mini-Projects and Reports a. Writing reports on any case of an infectious disease and how to manage it. b. Preparing presentations about any infectious disease. 5. Use of Multimedia a. Educational videos, device simulators (simulation software), and illustrative images to facilitate understanding.	

6. Continuous Assessment

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
1	2	First: Cognitive Outcomes (Knowledge Outcomes) The student will be able to define what infectious diseases are, their methods of prevention, and how to manage them.	Introduction to Infectious Diseases Classification based on specific criteria The body's response to them Sources of infection Routes of entry into the body	Learning through Theoretical Lectures - To clarify the fundamental principles and details of the spread of infectious diseases and prevention methods. - Using presentation slides (PowerPoint) and illustrative diagrams.	
2	2		Continuation of the First Lecture		
3	2		Classification of infectious diseases by disease severity		
4	2		Techniques used for diagnosing infectious diseases		
5	2	Second:	Modes of transmission of infectious diseases		
6	2	Skills	Types of microorganisms causing infectious diseases		
7	2	Outcomes	Bacterial Infections		
8	2	1.			
9	2	Diagnosis:			
10	2	The skill of taking an epidemiological history,			
11	2	creating a list of potential diseases, and			
12	2	selecting appropriate tests.			
13	2	2.			
14	2	Treatment:			
15	2	The ability to choose an appropriate antibiotic or treatment based on the	Examples of Bacilli (Rod-shaped bacteria) causing infectious diseases: Anthrax		

type of microbe and laboratory results.

3.

Prevention:

Applying infection control procedures, advising patients on prevention methods, and understanding vaccination programs.

4. **General**

Skills:

Interpreting laboratory results, communicating effectively with patients, and understanding the medical ethics related to infectious diseases.

Third:

Affective Outcomes (Attitudinal Outcomes)

1.

Commitment to accuracy, honesty, maintaining patient confidentiality, and handling samples with respect.

Tuberculosis
Tetanus
Diphtheria
Botulism

Examples of Cocci (Spherical bacteria):

Streptococci
Staphylococci

Other Pathogens

Viruses
Fungi
Parasites

Body's Defenses Against Infectious Diseases

Pathogenesis and Virulence Factors

What are the virulence factors of microorganisms?

Examples of some diseases and their causes
Body's Immunity Against Infectious Diseases

Types of immunity against infectious diseases
Inflammatory Response to Infectious Diseases
Acute and Chronic
Inflammation

		2. Awareness of biosafety to protect oneself and the community from the spread of infection.	Pathogenesis of Microorganisms Causing Infectious Diseases Investigation of Infectious Diseases How to prepare samples Methods of laboratory diagnosis Examples of Specific Diseases Intestinal Diseases Typhoid Fever Anthrax Brucellosis (Malta Fever) Tetanus Pulmonary Tuberculosis Types of Tuberculosis Acquired Immunodeficiency Syndrome (AIDS) Methods of transmission Stages of the disease		
11. Course Evaluation					
12. Learning and teaching references					
	Principle and practice of infectious Disease				
	Comprehensive review of infectious disease				

Course Description Form

15. Course name:

Clinical immunology

16. Course code:

ت 303

17. Semester/Year:

first semester / 2025-2026

18. Date this description was prepared:

1/9/2025

19. Available forms of attendance:

20. Number of study hours (total) / Number of units (total):

4/3

21. Name of course administrator (if more than one name is mentioned)

Prof. Dr. Shereen Jawad Al-Ali

8. Course objectives

Course objectives

- Learning about clinical immunology, the immune disorders and their diagnostic methods
- Learning the practical way to perform the laboratory tests including immune assays.
- Learning about the instruments that can be used to perform these immune assays

9. Learning and teaching strategies

Strategy

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be

achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
1-15	4	Learning about clinical immunology, the immune disorders and their diagnostic methods Learning the practical way to perform the laboratory tests including immune assays. Learning about the instruments that can be used to perform these immune assays	1. Introduction to immunology (revision) 2. Introduction to hypersensitivity 3. Hypersensitivity I: types, diseases, diagnosis & treatment 4. Hypersensitivity II: types, diseases, diagnosis & treatment 5. Hypersensitivity IV: types, diseases, diagnosis & treatment 6. Tumor immunology 7. Transplantation immunology 8. Immunodeficiencies: types, diseases, diagnosis & treatment I 9. Immunodeficiencies: types, diseases, diagnosis & treatment II 10. Systemic autoimmune diseases: pathogenesis, diagnosis & treatment 11. Organ-specific autoimmune diseases of the glands 12. Organ-specific autoimmune diseases of gastrointestinal tract 13. Organ-specific autoimmune diseases of the liver 14. Organ-specific autoimmune diseases of the kidney Immunotherapy: definition, types and application	Lecture, presentation and videos	Quizzes, mid term exam and lab. exam

11. Course Evaluation

Quizzes, mid term exam and lab. exam

12. Learning and teaching references

- Kuby Immunology, 2013, 7th edition
- Essential clinical immunology, 2009
- Janeway's ImmunoBiology, 2017, 9th edition
- Lippincott immunology

Course Description Form

22. Course name:

Serology and vaccines

23. Course code:

403 ت

24. Semester/Year:

first semester / 2025-2026

25. Date this description was prepared:

1/9/2025

26. Available forms of attendance:

27. Number of study hours (total) / Number of units (total):

4/3

28. Name of course administrator (if more than one name is mentioned)

Prof. Dr. Shereen Jawad Al-Ali

8. Course objectives

Course objectives

- Learning about serology and vaccine
- Learning the practical way to perform the serological laboratory technique including immune assays.
- Learning about the instruments that can be used to perform these immune techniques

9. Learning and teaching strategies

Strategy

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering

types of simple experiments involving some sampling activities that are interesting to the students.

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
1-15	4	Learning about serology and vaccine Learning the practical way to perform the serological laboratory technique including immune assays. Learning about the instruments that can be used to perform these immune techniques	1. Introduction to immunology (revision of Ag, Ab & Ag-Ab interaction) 2. Monoclonal Abs: definition, production, types & applications 3. Precipitation reaction: definition, principles, types & applications 4. Precipitation reaction in solutions: definition, principles, types & applications 5. Precipitation reaction in agar: definition, principles, types & applications 6. Immunoelectrophoresis: definition, principles, types & applications 7. Agglutination reactions: definition, principles, types & applications 8. Agglutination vs. precipitation 9. Haemagglutination: definition, principles & applications 10. Complement and complement fixation test 11. ELISA: definition, principles, types & applications 12. Immunofluorescence: definition, principles & applications 13. Radioimmunoassay: definition, principles & applications 14. Immunization 15. Vaccine : types and uses	Lecture, presentation and videos	Quizzes, mid term exam and lab. exam

11. Course Evaluation

Quizzes, mid term exam and lab. exam

12. Learning and teaching references

- Kuby Immunology, 2013, 7th edition
- Essential clinical immunology, 2009
- Janeway's ImmunoBiology, 2017, 9th edition
- Lippincott immunology

Course Description Form

29. Course name:

Principles of immunology

30. Course code:

ت 203

31. Semester/Year:

first semester / 2025-2026

32. Date this description was prepared:

1/9/2025

33. Available forms of attendance:

34. Number of study hours (total) / Number of units (total):

4/3

35. Name of course administrator (if more than one name is mentioned)

Prof. Dr. Shereen Jawad Al-Ali

8. Course objectives

Course objectives

- Understanding the principles of Immunology.
- Knowing the application of immunology.

9. Learning and teaching strategies

Strategy

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

10. Course structure

Week	Hours	Required educational outcomes	Name of unit or topic	Learning method	Evaluation method
1-15	4	Understanding the principles of Immunology. Knowing the application of immunology.	1. Introduction to immunology 2. Immune system's organs 3. Immune cells 4. Innate immunity: body covering and tissue defense 5. innate immunity: phagocytosis 6. Innate immunity: fever 7. Innate immunity: inflammation 8. Mid-term Exam 9. Antigen processing and presentation 10. Introduction to acquired immunity 11. Antigen 12. Humoral immune response: antibodies 13. Humoral immune response: B-cell differentiation 14. Cell-mediated immune response: T helper cells 15. Cell-mediated immune response: T cytotoxic cells	Lecture, presentation and videos	Quizzes, mid term exam and lab. exam

11. Course Evaluation

Quizzes, mid term exam and lab. exam

12. Learning and teaching references

- Kuby Immunology, 2013, 7th edition
- Essential clinical immunology, 2009
- Janeway's ImmunoBiology, 2017, 9th edition
- Lippincott immunology