

**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

2025-2026



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: Al-Furat Al-Awsat Technical University

Faculty/Institute: College of Health and Medical Techniques

Scientific Department: Medical Laboratory Techniques

Academic or Professional Program Name: Medical Laboratory Techniques

Final Certificate Name: Medical Laboratory Techniques

Academic System: Semester System

Description Preparation Date: 7/12/2025

File Completion Date: 7/12/2025

Signature:

Head of Department Name:

Prof. Dr. Abdulsamad Alawi Hassan

Date:

Signature:

Scientific Associate Name:

Asst. Prof. Dr. Ahmed Fadhil Ouda

Date:

Reviewed by:

Quality Assurance and University Performance Division

Head of the Quality Assurance and University Performance Division:

Assist. Lecturer Enas Kazem Abdulameer

Date:

Signature:

Dean's Approval



1. Program Vision

The Department of Medical Laboratory Technologies is responsible for the main reason that society needs professional medical personnel for a variety of public health and educational institutions. In addition, sports athlete to invest the skills of professors and demand in applied scientific research and learning. Likewise, there is less training and a broad understanding of technical knowledge through specialized medical laboratories to suit development in the world of pathological analysis techniques.

2. Program Mission

The Medical Laboratory Technology Department came to meet the needs of health institutions for professional cadres who have acquired skills and experience according to scientific and academic standards, by training these cadres to work in these institutions, as well as supporting the private sector in this regard. Developing teaching and student cadres in the fields of medical sciences and cognitive research, and striving to create postgraduate courses that prioritize the scientific balance of the department and other institutions, which works to consolidate the vision of scientific cooperation with other institutions, corresponding scientific departments and related institutions to achieve dedication in the fields of advanced science and technology.

3. Program Objectives

The department seeks to achieve the following goals:-

1. Graduates acquire basic knowledge and skills in the fields of medical laboratory analytical techniques.
2. Selecting and preparing the materials required to conduct pathological analyses.
3. Use laboratory equipment with scientific and practical skills.
4. Identifying the causes of disease, whether these causes are bacterial, parasitic, fungal or viral, and acquiring the ability to investigate them.
5. Diagnosing genetic diseases and distinguishing them from acquired diseases.
6. Dealing with infectious and communicable disease cases and how to prevent them inside the laboratory by implementing occupational safety guidelines.
7. Familiarity with the human aspects of the patient, which is an important part of treatment.



4. Program Accreditation

A detailed study was submitted to obtain accreditation, including a self-evaluation report, improvement plan, and conformity report.

5. Other External Influences

1-Furat Al-Awsat Technical University.

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	32	174	100%	
College Requirements				
Department Requirements	32	174	100%	
Summer Training	2	Satisfied	100%	
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
The First Stage – The First Semester	ATU-13-MLT-111-C-ME	General chemistry 1	2	5
	ATU-13-MLT-112-C-ME	Medical terminology	2	--
	ATU-13-MLT-113-C-ME	Human biology 1	2	5
	ATU-13-MLT-114-C-ME	Laboratory instruments 1	2	4
	ATU-13-MLT-115-C-ME	Medical ethics	2	--
	ATU-13-MLT-116-C-ME	Computer Applications 1	1	2
	ATU-13-MLT-117-C-ME	Human rights and Democracy	2	--

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).



The First Stage - The Second Semester	ATU-13-MLT-120-C-ME	Anatomy	2	5
	ATU-13-MLT-121-C-ME	Human biology 2	2	5
	ATU-13-MLT-122-C-ME	Laboratory instruments 2	2	4
	ATU-13-MLT-123-C-ME	Arabic language	2	--
	ATU-13-MLT-119-C-ME	General chemistry 2	2	5
	ATU-13-MLT-118-C-ME	Computer Applications 2	1	2
The Second Stage			Theoretical	Practical
The Second Stage - The First Semester	ATU-13-MLT-211-C-ME	Medical Bacteriology 1	2	4
	ATU-13-MLT-212-C-ME	Biochemistry 1	2	4
	ATU-13-MLT-213-C-ME	Human physiology 1	2	4
	ATU-13-MLT-214-C-ME	Histology 1	2	4
	ATU-13-MLT-215-C-ME	Molecular Biology 1	2	4
	ATU-13-MLT-216-C-ME	Medical Parasitology 1	2	4
	ATU-13-MLT-217-C-ME	Crimes of the defunct Baath regime	2	--
	ATU-13-MLT-218-C-ME	Computer Applications 1	1	2
The Second Stage - The Second Semester	ATU-13-MLT-219-C-ME	Medical Bacteriology 2	2	4
	ATU-13-MLT-220-C-ME	Biochemistry 2	2	4
	ATU-13-MLT-221-C-ME	Human physiology 2	2	4
	ATU-13-MLT-222-C-ME	Histology 2	2	4
	ATU-13-MLT-223-C-ME	Medical Parasitology 2 & Entomology	2	4
	ATU-13-MLT-224-C-ME	Descriptive Biostatistics	1	2
	ATU-13-MLT-225-C-ME	Arabic language	2	-
The Third Stage			Theoretical	Practical
The Third Stage - The	ATU-13-MLT-311-C-ME	Histopathology 1	2	2
	ATU-13-MLT-312-C-ME	Hematology 2	2	2
	ATU-13-MLT-313-C-ME	Medical Mycology	2	4





The Third Stage - The Second Semester	ATU-13-MLT-316-C-ME	Immunology1	2	4
	ATU-13-MLT-317-C-ME	Advanced Laboratory Techniques	2	2
	ATU-13-MLT-318-C-ME	Computer Applications1	1	2
	ATU-13-MLT-321-C-ME	Histopathology2	2	2
	ATU-13-MLT-322-C-ME	Hematology 2	2	2
	ATU-13-MLT-323-C-ME	Medical Virology	2	4
	ATU-13-MLT-324-C-ME	Endocrinology (Clinical)	2	4
	ATU-13-MLT-325-C-ME	Medical Genetics 2	2	4
	ATU-13-MLT-326-C-ME	Immunology 2	2	4
	ATU-13-MLT-327-C-ME	Analytical Biostatistics	1	2
	ATU-13-MLT-328-C-ME	Computer Applications 2	1	2
Fourth Stage			Theoretical	Practical

The Fourth Stage - The First Semester	ATU-13-MLT-411-C-M	Clinical Immunology 1	2	4
	ATU-13-MLT-412-C-M	Diagnostic Bacteriology 1	2	4
	ATU-13-MLT-413-C-M	Clinical Enzymology 1	2	4
	ATU-13-MLT-414-C-M	Diagnostic Parasitology 1	2	4
	ATU-13-MLT-415-C-M	Blood Transfusion	2	4
	ATU-13-MLT-416-C-M	pathology	2	4
	ATU-13-MLT-417-C-M	Professional Ethics	2	--
	ATU-13-MLT-418-C-M	Graduation Project	--	5
Fourth Stage			Theoretical	Practical

	ATU-13-MLT-421-C-M	Clinical Immunology 2	2	4
	ATU-13-MLT-422-C-M	Diagnostic Bacteriology 2	2	4
	ATU-13-MLT-423-C-M	Clinical Chemistry	2	4
		8		

The Fourth Stage - The Second Semester	ATU-13-MLT-421- C-M	Diagnostic Parasitology 1	2	4
	ATU-13-MLT-422- C-M	Antibiotic Resistance and Infection Control	2	4
	ATU-13-MLT-423- C-M	Stem Cell Biology and Embryology	2	
	Atu_chmML4-17	Laboratory Management	1	--
	Atu_chmML4-18	Research Methods	1	





8. Expected learning outcomes of the program

A-Knowledge Outcomes.	A1 – Demonstrates comprehensive knowledge of the theoretical foundations of microbiology, clinical chemistry, hematology, immunology, and parasitology. A2 – Differentiates among various laboratory testing techniques, recognizing their specific diagnostic purposes. A3 – Accurately outlines the procedures and protocols for the collection and analysis of biological samples in accordance with scientific standards. A4 – Interprets the correlation between laboratory test results and corresponding clinical conditions. A5 – Defines and applies quality assurance principles and performance control measures within medical laboratories. A6 – Identifies the normal functions of human body organs and explains their relevance to laboratory testing. A7 – Operates and maintains advanced laboratory equipment with proficiency.
B- Skill Outcomes.	B1 – Performs blood and other body fluid analyses with high accuracy. B2 – Operates laboratory analysis equipment with technical proficiency. B3 – Prepares slides and laboratory assays, and effectively uses microscopes. B4 – Calibrates laboratory solutions and applies chemical analysis methods with precision. B5 – Handles and processes biological samples in compliance with safety protocols. B6 – Accurately documents laboratory findings and prepares comprehensive reports. B7 – Adheres to safety and security regulations, infection control measures, and patient care protocols.

**C-Valuable
Outcomes.**

- C1** – Adheres to professional ethics, maintaining confidentiality, accuracy, and respect for patient privacy.
- C2** – Demonstrates professional accountability and complies with established health regulations and guidelines.
- C3** – Respects cultural, religious, and social diversity within the workplace.
- C4** – Collaborates effectively as part of a medical team, fostering a spirit of cooperation.
- C5** – Engages in continuous learning and professional development to remain current with advances in medical laboratory technology.
- C6** – Exercises professional integrity and diligence when interpreting laboratory results.
- C7** – Takes responsibility for training and mentoring new staff within the field.

9-Teaching and Learning Strategies:

Blended education, which consists of in-person education, including classrooms with smart screens and specialized educational laboratories according to academic subjects, in addition to electronic communication with students for the purpose of assigning some assignments and instructions.

10-Evaluation methods:

Implemented in all stages of the program in general.
Theoretical and practical (clinical) exams, rapid exams, and classroom activities.





NO.	Academic Rank	Specialization	Faculty Members Count	Staff	Lecturer
		General	Special		
1.	Prof. Dr. Angham Jasim Mohammed Ali	Biology	Immunology	Dean	Yes
2.	Prof. Dr. Abdul Samad Alawi Hassan	Biology	Physiology	Head of Department	Yes
3.	Prof. Dr. Hassan Furman	Biology	Physiology	Lecturer	
4.	Prof. Dr. Kazem Mohammed Sabea	Biology	Physiology	Lecturer	Yes
5.	Asst. Prof. Dr. Ahmed Fadhil Ouda	Pathological Analyses	Biochemistry and Clinical Chemistry / Metabolic Biochemistry	Assistant Dean	Yes
6.	Assist. Prof. Dr. Qais Khudair Abdulabba	Biology	Microbiology / Immunology	Lecturer	Yes
7.	Assist. Prof. Radhiya Fadel Hussein	Medical Analysis Technology	Immunology	Lecturer	Yes
8.	Assist. Prof. Dr. Ali Mohammed Abdul Hamoud	Chemistry Sciences	Clinical Biochemistry	Lecturer	Yes
9.	Assist. Prof. Najat Mohammed Qailah	Analytical Sciences	Genetics	Lecturer	Yes
10.	Lecturer.Prof. Athmar Ali Kazem	Chemistry Education	Inorganic Chemistry	Lecturer	Yes
11.	Lecturer.Prof. Ruaa Kareem Sarhan	Life Sciences	Immunology	Lecturer	Yes
12.	Lecturer.Prof. Ruaa Mohammed Hussein	Life Sciences Education	Virology	Lecturer	Yes
13.	Lecturer.Prof. Zahraa Basim Shakir	Life Sciences	Microbiology	Lecturer	Yes
14.	Assist. Prof. Dr. Qais Khudair Abdul Abbas	Life Sciences	Microbiology	Lecturer	Yes
15.	Lecturer Ahmed Taklif Tali	Computer Science	Computer Science	Lecturer	Yes
16.	Lecturer.Prof. Ahmed Abdul Redha	Life Sciences	Microbiology	Lecturer	Yes
17.	Assist. Lecturer Enas Kazem Abdul Ameer	Life Sciences	Microbiology	Lecturer	Yes
18.	Assist. Lecturer Hooria Saeed Ibrahim	Chemistry Sciences	Inorganic Chemistry	Lecturer	Yes
19.	Assist. Lecturer Zahraa Falah Abdul Aali	Life Sciences	Physiology	Lecturer	Yes
20.	Lecturer Abbas Hussein	Pathology	Histopathology	Lecturer	Yes

NO.	Academic Rank	Specialization	Faculty Members Count	Staff	Lecturer
		General	Special		
	Obaid				
21.	Lecturer.Prof. Sarah Ali Hamid	Pathological Analyses	Parasitology	Lecturer	Yes
22.	Asst. Lecturer Sadiq Mohammed Ali Hussein	Pathological Analyses	Mycology	Lecturer	Yes
23.	Asst. Lecturer Zainab Thamer Abbas	Sharia	Jurisprudence & Principles	Yes	Yes
24.	Asst. Lecturer Hassan Ali Hassan	Quranic Sciences	Quranic Sciences	Lecturer	Yes



Professional Development

Mentoring new faculty members

Adherence to official working hours. - Adherence to the timings of lectures, exams, and the course of the educational process. - Encouraging the completion of scientific research. - Follow up on the progress of lectures and completion rates for lectures. - Conduct a self-report assessment. Professional development of faculty m

Professional development of faculty members

- Carrying out various scientific activities (seminars, courses, discussion groups, etc.).
- Participation in scientific conferences.
- Participation in scientific activities related to continuing education.

1- Acceptance Criterion

The admission plan for the Department of Medical Laboratory Technology is 100 morning students and 100 evening students.

The most important sources of information about the program

The official website of the college and university.



Curriculum Skills Map

Required learning outcomes of the program

Year/ Level	Course Code	Course Name	Essential or Optional	Cognitive objectives							Program skill objectives							Emotional and value goals						
				A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	C5	C6	C7
The first stage - first course.	Atu_chmML 111	General Chemistry 1	Essential	✓	✓		✓	✓			✓			✓			✓				✓			
	Atu_chmML 112	Medical Terminology	Essential				✓					✓										✓		✓
	Atu_chmML 113	Human Biology 1	Essential	✓	✓	✓	✓	✓	✓		✓				✓		✓		✓		✓	✓		
	Atu_chmML 114	Laboratory Instruments 1	Essential	✓	✓			✓		✓		✓	✓								✓	✓		
	Atu_chmML 115	Medical Ethics	Optional												✓	✓	✓	✓	✓	✓	✓	✓	✓	
The first stage - the second course	Atu_chmML 116	Computer Applications 1	Optional						✓		✓					✓						✓		
	Atu_chmML 117	Human Rights	Optional														✓	✓	✓	✓	✓	✓		
	Atu_chmML 118	English Language	Optional								✓	✓		✓		✓	✓		✓	✓	✓	✓		
	Atu_chmML 121	General Chemistry 2	Essential	✓	✓		✓				✓			✓			✓							
	Atu_chmML 122	Anatomy	Essential	✓	✓		✓														✓			
	Atu_chmML 123	Human biology 2	Essential	✓	✓	✓	✓	✓	✓		✓		✓		✓		✓		✓	✓			✓	



course.	Atu_chmML 124	Laboratory instruments 2	Essential																					
Year/ Level	Course Code	Course Name	Essential or Optional	Cognitive objectives							Program skill objectives							Emotional and value goals						
				A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	C5	C6	C7
The second stage - the first course	Atu_chmML 211	Medical Bacteriology1	Essential	✓	✓	✓	✓	✓			✓				✓	✓	✓				✓	✓		
	Atu_chmML 212	Biochemistry1	Essential	✓	✓		✓				✓						✓							
	Atu_chmML 213	Human physiology1	Essential	✓	✓		✓													✓				
	Atu_chmML 214	Histology1	Essential	✓	✓	✓	✓	✓			✓		✓			✓	✓					✓		
	Atu_chmML 215	Molecular Biology1	Essential	✓	✓	✓	✓		✓		✓					✓	✓					✓		
	Atu_chmML 216	Medical Parasitology1	Essential	✓	✓		✓	✓			✓		✓			✓	✓					✓		
The second stage - the second course.	Atu_chmML 217	Crimes of the defunct Baath regime	Optional															✓						
	Atu_chmML 218	Computer Applications 1	Optional																					
	Atu_chmML 221	Medical Bacteriology2	Essential	✓	✓	✓	✓	✓	✓		✓				✓	✓	✓					✓		
	Atu_chmML 222	Biochemistry2	Essential	✓	✓		✓				✓									✓	✓		✓	
	Atu_chmML 223	Human physiology2	Essential	✓	✓		✓																	
	Atu_chmML 224	Histology2	Essential	✓	✓			✓	✓		✓		✓				✓					✓		



Year/ Level	Course Code	Course Name	Essential or Optional	Cognitive objectives							Program skill objectives							Emotional and value goals						
				A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	C5	C6	C7
	Atu_chmML 225	Medical Parasitology 2 & Entomology	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓
	Atu_chmML 226	Descriptive Biostatistics	Optional				✓				✓					✓					✓			
	Atu_chmML 227	Arabic language																						
The third stage - the first course.	Atu_chmML 311	Histopathology I	Essential	✓	✓	✓	✓				✓		✓		✓	✓	✓		✓		✓	✓	✓	
	Atu_chmML 312	Hematology	Essential	✓	✓	✓	✓				✓		✓		✓	✓	✓		✓		✓	✓	✓	
	Atu_chmML 313	Medical Mycology	Essential	✓	✓	✓	✓		✓		✓		✓		✓		✓				✓	✓	✓	
	Atu_chmML 314	Metabolic Disorders	Essential	✓	✓		✓																	
	Atu_chmML 315	Medical Genetics	Essential	✓	✓		✓				✓										✓			✓
	Atu_chmML 316	Immunology	Essential	✓	✓	✓	✓		✓		✓					✓	✓				✓	✓	✓	✓
	Atu_chmML 317	Advanced Laboratory Techniques	Essential		✓	✓			✓		✓		✓	✓								✓	✓	✓
	Atu_chmML 318	Computer Applications	Optional								✓	✓				✓						✓		
The third stage - the second course.	Atu_chmML 321	Histopathology	Essential	✓	✓	✓	✓				✓		✓		✓	✓	✓			✓	✓	✓	✓	✓
	Atu_chmML 322	Hematology 2	Essential	✓	✓	✓	✓		✓		✓		✓		✓	✓	✓			✓	✓	✓	✓	✓
	Atu_chmML 323	Medical Virology	Essential	✓	✓	✓	✓				✓				✓	✓	✓			✓	✓	✓	✓	✓
	Atu_chmML 324	Endocrinology	Essential	✓	✓		✓				✓					✓						✓		✓



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Ministry of Higher Education and Scientific Research

Supervision and Scientific Evaluation Authority

Quality Assurance and Academic Accreditation Department

Accreditation Division

Course Description Guide

Department of Medical Laboratory Techniques

College of Health and Medical Techniques

Al-Furat Al-Awsat Technical University

Academic Year 2025 – 2026



FIRST YEAR — COURSE DESCRIPTIONS

Department of Medical Laboratory Techniques | 2025–2026

Course Description Form — Laboratory Equipment 1

1. Course Name	Laboratory Equipment 1
2. Course Code	ATU-13-MLT-114-C-ME
3. Semester / Year	First Semester / First Year
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	6 Study Hours / 4 Units
7. Course Coordinator	Asst. Lect. Enas Kazem Abdul Amir
Email	enas.kazem.chm@atu.edu.iq

8. Course Objectives

Subject Matter Goals:

- Familiarize students with the basic fundamental concepts of the subject, its scientific theoretical and practical aspects.
- Increase efficiency and effectiveness in managing medical laboratories in line with the goals of the Medical Laboratory Techniques Department.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration
- Cooperative learning – Problem solving – Simulation
- Brainstorming – Role-playing
- Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	6	Study, Knowledge & Application (Practical)	General Introduction	Theoretical + Practical	Written & Practical Exams
2	6	Study, Knowledge & Application (Practical)	Brightfield Microscope Simple Microscope Compound Microscope • Parts & Principle • Illumination, Magnification &	Theoretical + Practical	Written & Practical Exams



			Resolution • Setting Up & Uses • Care & Safety		
3	6	Study, Knowledge & Application (Practical)	Phase Contrast Microscopy Darkfield Microscopy Fluorescent Microscope • Parts & Principle • Setting Up & Uses • Care & Safety	Theoretical + Practical	Written & Practical Exams
4	6	Study, Knowledge & Application (Practical)	Electron Microscope • Parts & Principle • Magnification & Resolution • Uses • Tutorial Sheet	Theoretical + Practical	Written & Practical Exams
5	6	Study, Knowledge & Application (Practical)	Beer-Lambert Law	Theoretical + Practical	Written & Practical Exams
6	6	Study, Knowledge & Application (Practical)	Photometer & Spectrometer • Parts & Principle • Uses	Theoretical + Practical	Written & Practical Exams
7	6	Study, Knowledge & Application (Practical)	Spectrophotometer • Parts & Principle • Setting Up & Calibration • Uses & Care • Tutorial Sheet	Theoretical + Practical	Written & Practical Exams
8	6	Study, Knowledge & Application (Practical)	Overview	Theoretical + Practical	Written & Practical Exams
9-10	6	Study, Knowledge & Application (Practical)	Centrifugation • Parts & Principle of the Centrifuge • Setting Up • Types & Uses • Care & Safety	Theoretical + Practical	Written & Practical Exams
11-12	6	Study, Knowledge & Application (Practical)	Chromatography Apparatus (Chromatograph) • Principle & Types • Paper Chromatography • Thin-Layer Chromatography • Column Chromatography	Theoretical + Practical	Written & Practical Exams
13-14	6	Study, Knowledge & Application (Practical)	Electrophoresis Apparatus • Principle & Uses • Care & Safety	Theoretical + Practical	Written & Practical Exams
15	6	Study, Knowledge & Application (Practical)	Types & Uses of Laboratory Filters	Theoretical + Practical	Written & Practical Exams

11. Course Evaluation

Distributed out of 100: 10 Attendance & Absence | 10 Classroom Activities | 20 Monthly Exam | 60 Final Exam (Theoretical & Practical).

12. Learning and Teaching Resources

Required Textbooks	Braybrook, J.H. (1996). Biocompatibility: Assessment of Medical Devices and Materials.
Main References	—
Recommended Books	—
Electronic Sources	—





Course Description Form — Laboratory Equipment 2

1. Course Name	Laboratory Equipment 2
2. Course Code	ATU-13-MLT-122-C-ME
3. Semester / Year	Second Semester / First Year
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	6 Study Hours / 4 Units
7. Course Coordinator	Asst. Lect. Enas Kazem Abdul Amir
Email	enas.kazem.chm@atu.edu.iq

8. Course Objectives

At the end of the academic year, the student will be able to understand the functions of the various cells and systems of the body in general, and perform various techniques for analyzing blood and other body fluids.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration
- Cooperative learning – Problem solving – Simulation
- Brainstorming – Role-playing
- Collaborative workshops

10. Course Structure

Weeks	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1–4	6	Study, Knowledge & Application (Practical)	Microbiological Safety Cabinet • Types of Safety Cabinet • Principle & Uses • Maintenance Incubator – Types, Principle & Uses, Care Pipettes, Bunsen Burner, Water Bath & Dry Oven	Theoretical + Practical	Written & Practical Exams
5–7	6	Study, Knowledge & Application (Practical)	Autoclave – Principle & Uses Sterilization Methods and Equipment Hot Air Oven – Principle, Types & Uses	Theoretical + Practical	Written & Practical Exams
8–10	6	Study, Knowledge & Application (Practical)	pH Meter – Parts, Principle, Calibration & Uses Balances (Analytical & Top-Loading) – Principle & Uses	Theoretical + Practical	Written & Practical Exams

11-13	6	Study, Knowledge & Application (Practical)	Refrigerators & Freezers – Types & Proper Storage Laminar Flow Hood – Types, Principle & Uses Magnetic Stirrer & Hot Plate Vortex Mixer – Principle & Uses	Theoretical + Practical	Written & Practical Exams
14-15	6	Study, Knowledge & Application (Practical)	Hemocytometer – Parts, Principle & Uses Tutorial Sheet & Practical Review	Theoretical + Practical	Written & Practical Exams

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).

12. Learning and Teaching Resources

Required Textbooks	Standard medical laboratory equipment manuals and references
Main References	Standard texts on laboratory instruments
Electronic Sources	—





Course Description Form — General Chemistry

1. Course Name	General Chemistry
2. Course Code	ATU-13-MLT-111-C-ME
3. Semester / Year	2025 / 2026 (Semester)
4. Description Date	30-12-2025
5. Attendance Mode	In-Person
6. Credit Hours / Units	7 Study Hours / 4 Units
7. Course Coordinator	Asst. Lect. Hawra Saeed Ibrahim
Email	hawra.ibrahimckm@atu.edu.iq

8. Course Objectives

First: Knowledge Objectives:

- Introduce the student to the chemistry laboratory in general.
- Learn how to perform organic chemical reactions and prepare standard solutions at various concentrations.

Second: Skill Objectives:

- Enable the student to work safely inside the laboratory, taking proper precautions and following safety guidelines when handling chemical substances.
- Teach the student how to use laboratory equipment and prepare solutions.

9. Teaching and Learning Strategies

- Cooperative learning strategy
- Brainstorming strategy
- Exchange of views and discussion strategy
- Information presentation strategy

Assessment Methods: Daily oral and written exams | Reports | Discussions.

10. Course Structure — Semester 1

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
First	2 Th.	Understanding lecture content	Introduction to Chemistry • Atomic structure • The periodic table • Isotopes • Chemical bonds • Types of chemical reactions	Cooperative learning Brainstorming Exchange of views Information presentation	Daily oral & written exams Reports Discussions
Second	2 Th.	Understanding lecture content	Analytical Chemistry • Types of solutions	Cooperative learning Brainstorming Exchange of	Daily oral & written exams Reports Discussions



			• Standard solutions • Preparation of standard solutions & concentrations	views Information presentation	
Third	2 Th.	Understanding lecture content	Analytical Chemistry • Molar concentration • Normal concentration • Concentration in parts per million (ppm)	Cooperative learning Brainstorming Exchange of views	Daily oral & written exams Reports Discussions
Fourth	2 Th.	Understanding lecture content	Analytical Chemistry • Chemical equilibrium • Buffer solutions	Cooperative learning Brainstorming Exchange of views	Daily oral & written exams Reports Discussions
Fifth	2 Th.	Understanding lecture content	Titration • Oxidation-reduction titrations • Complex titrations	Cooperative learning Brainstorming Exchange of views	Daily oral & written exams Reports Discussions
Sixth	2 Th.	Understanding lecture content	Acid-Base Chemistry • Types of chemical reactions • pH measurement	Cooperative learning Brainstorming Exchange of views	Daily oral & written exams Reports Discussions
Seventh-Eighth	2 Th.	Understanding lecture content	Biochemistry Basics • Carbohydrates • Lipids • Proteins	Cooperative learning Brainstorming	Daily oral & written exams Discussions
Ninth	2 Th.	Understanding lecture content	Organic Chemistry • Functional groups • Hydrocarbons	Cooperative learning Brainstorming	Daily oral & written exams
Tenth	2 Th.	Understanding lecture content	Electrochemistry • Electrolytic cells • Galvanic cells	Cooperative learning Brainstorming	Daily oral & written exams
Eleventh-Twelfth	2 Th.	Understanding lecture content	Analytical Techniques • Photometric methods • Flame photometry	Cooperative learning Brainstorming	Daily oral & written exams Reports
Thirteenth	2 Th.	Understanding lecture content	Radiochemistry – Basic Concepts	Cooperative learning	Daily oral & written exams
Fourteenth-Fifteenth	2 Th.	Understanding lecture content	Nuclear Chemistry & Radioactive Isotopes in Medicine	Cooperative learning Information presentation	Daily oral & written exams Reports

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).

12. Learning and Teaching Resources

Required Textbooks	Standard general chemistry textbooks used in medical sciences
Main References	Lehninger Principles of Biochemistry; Atkins Physical Chemistry
Electronic Sources	Google Scholar Research Gate





Course Description Form — English Language

1. Course Name	English Language
2. Course Code	ATU-13-MLT-115-C-ME
3. Semester / Year	First & Second Semester / First Year
4. Description Date	30-12-2025
5. Attendance Mode	In-Person
6. Credit Hours / Units	30 Study Hours / 2 Units
7. Course Coordinator	Asst. Lect.
Email	—

8. Course Objectives

- Enable students to read, write, and communicate in English at a basic to intermediate level.
- Build essential English vocabulary needed in the medical laboratory context.
- Develop listening and comprehension skills for academic English.

9. Teaching and Learning Strategies

- Theoretical and practical field visits and hospital/lab visits
- Lectures supported by presentations and visual aids
- Video clips and foreign university lectures
- Open discussion groups

10. Course Structure

Weeks	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1-3	2 Th.	Understanding lecture content	Introduction to English – Parts of Speech • Nouns, verbs, adjectives, adverbs	Lecture delivery	Written & oral exams
4-6	2 Th.	Understanding lecture content	Present Tense – Simple & Continuous Vocabulary: Lab terminology	Lecture delivery	Written & oral exams
7-9	2 Th.	Understanding lecture content	Past Tense – Simple & Continuous Reading comprehension passages	Lecture delivery	Written & oral exams
10-12	2 Th.	Understanding lecture content	Future Tense • Writing skills • Paragraph writing	Lecture delivery	Written & oral exams
13-15	2 Th.	Understanding lecture content	Conversational English • Medical English	Lecture delivery Discussion	Written & oral exams

vocabulary
• Report writing

11. Course Evaluation

Distributed out of 100: Attendance 10 | Participation 10 | Peer evaluation 10 | Weekly reports 10 | Monthly exam 20 | Final exam 40.

12. Learning and Teaching Resources

Required Textbooks	New Headway Beginners; Headway Series
Recommended Books	Research Gate resources
Electronic Sources	Google Scholar Google Books





Course Description Form — Arabic Language 1

1. Course Name	Arabic Language 1
2. Course Code	ATU-13-MLT-123-C-ME
3. Semester / Year	Second / 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person
6. Credit Hours / Units	2 Units
7. Course Coordinator	Dr. Bishayr Hashim Ahmed
Email	—

8. Course Objectives

- Teach students how to read correct standard Arabic (Modern Standard Arabic).
- Develop students' ability in Arabic grammar, parsing, and writing.
- Enable students to write formal academic Arabic texts relevant to the medical field.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific presentation – Cooperative learning
- Problem solving – Simulation
- Brainstorming – Role-playing
- Collaborative workshops

10. Course Structure

Weeks	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1–2	2 Th.	The student recognizes the parts of speech	Parts of Speech (أقسام الكلام)	Lecture delivery & Q&A	Written & oral exams
3–4	2 Th.	The student recognizes the noun and its markers	The Noun and Its Markers (الاسم وعلاماته)	Lecture delivery & Q&A	Written & oral exams
5–6	2 Th.	The student recognizes the verb, its forms and markers	The Verb, Its Forms and Markers (الفعل وأقسامه وعلاماته)	Lecture delivery & Q&A	Written & oral exams
7–8	2 Th.	The student recognizes grammatical analysis (إعراب و البناء)	Grammatical Parsing and Morphological Analysis	Lecture delivery & Q&A	Written & oral exams
9–10	2 Th.	The student recognizes case endings and their markers	Case Endings and Their Markers (الحالات الإعرابية وعلاماتها)	Lecture delivery & Q&A	Written & oral exams
11–12	2 Th.	The student recognizes indeclinable nouns	Indeclinable Nouns (الاسماء المعنوية)	Lecture delivery & Q&A	Written & oral exams

13-15	2 Th.	Application and revision	Comprehensive Review & Practical Writing Exercises	Lecture delivery & Discussion	Written & oral exams
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11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).

12. Learning and Teaching Resources

Required Textbooks	Standard Arabic grammar and language textbooks
Electronic Sources	Digital Arabic language resources



Course Description Form — Computer Basics



1. Course Name	Computer Basics / Fundamentals of Computing
2. Course Code	ATU-13-MLT-116-C-ME
3. Semester / Year	First / 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person
6. Credit Hours / Units	60 Study Hours / 3 Units
7. Course Coordinator	Asst. Lect. Ahmed Taklif
Email	—

8. Course Objectives

- Familiarize students with operating systems and basic computer operations.
- Enable students to use file management, word processing, and spreadsheet applications.
- Introduce hardware and software components relevant to the medical laboratory environment.

9. Teaching and Learning Strategies

- Theoretical and practical field visits and laboratory sessions
- Lectures supported by presentations, visual aids, and video clips
- Open discussion and collaborative workshops

10. Course Structure

Weeks	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1–2	2 Th.+2 Pr.	Understand the lecture content	Operating System • Windows fundamentals • Desktop management	Lecture + Practical lab application	Written, oral & practical exams Lab attendance
3–4	2 Th.+2 Pr.	Understand the lecture content	Hardware and Software • CPU, RAM, storage devices • Input/output devices	Lecture + Practical lab application	Written, oral & practical exams Lab attendance
5–6	2 Th.+2 Pr.	Understand the lecture content	Files and Folders • Creating, organizing, copying, moving files • File formats and extensions	Lecture + Practical lab application	Written, oral & practical exams Lab attendance
7–8	2 Th.+2 Pr.	Understand the lecture content	Folders and Files Management • Search, sort, archive • Recycle Bin management	Lecture + Practical lab application	Written, oral & practical exams Lab attendance
9–10	2 Th.+2 Pr.	Understand the lecture content	Computer Hardware	Lecture + Practical lab	Written, oral & practical exams

			• Motherboard • Graphics card • Sound card • Network cards	application	Lab attendance
11-12	2 Th.+2 Pr.	Understand the lecture content	• Tab Settings & Word Processing (Microsoft Word) • Basic document creation • Formatting	Lecture + Practical lab application	Written, oral & practical exams
13-15	2 Th.+2 Pr.	Understand the lecture content	• Introduction to Spreadsheets (Microsoft Excel) • Data entry • Basic formulas • Charts	Lecture + Practical lab application	Written, oral & practical exams

11. Course Evaluation

100 marks: Written theoretical exams | Oral exams | Practical in-lab exams | Lab attendance.

12. Learning and Teaching Resources

Required Textbooks	Standard computer literacy textbooks for medical science students
Electronic Sources	Online tutorials Microsoft Learning Resources



SECOND YEAR — COURSE DESCRIPTIONS

Department of Medical Laboratory Techniques | 2025–2026



Course Description Form — Medical Bacteriology 1

1. Course Name	Medical Bacteriology 1
2. Course Code	ATU-13-MLT-211-C-ME
3. Semester / Year	First Semester / Second Year
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	6 Study Hours / 4 Units
7. Course Coordinator	Dr. Zahraa Basem Shaker
Email	—

8. Course Objectives

- Familiarize the student with the fundamental scientific concepts of the subject, its theoretical and practical aspects.
- Increase the efficiency and effectiveness of laboratory data analysis.
- Achieve the goals of the Medical Laboratory Techniques Department.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration
- Cooperative learning – Problem solving – Simulation
- Brainstorming – Role-playing
- Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	6	Study, Knowledge & Application (Practical)	Introduction: Classification of Bacteria	Theoretical + Practical	Written & Practical Exams
2–5	6	Study, Knowledge & Application (Practical)	Structure and Function of Bacteria • Growth and death of bacteria • Culturing of bacteria • Types of culture media	Theoretical + Practical	Written & Practical Exams
6–7	6	Study, Knowledge & Application	Bacterial Physiology • Bacterial	Theoretical + Practical	Written & Practical Exams

		(Practical)	metabolism • Nutrient cycles and regulation		
8	6	Study, Knowledge & Application (Practical)	Bacterial Genetics • Genetic material • Plasmids • DNA replication, mutation and genetic recombination	Theoretical + Practical	Written & Practical Exams
9–10	6	Study, Knowledge & Application (Practical)	Microbial Virulence Factors and Pathogenesis of Bacterial Infection • Microflora	Theoretical + Practical	Written & Practical Exams
11	6	Study, Knowledge & Application (Practical)	Chemotherapy and Antibiotic Resistance • Vaccination	Theoretical + Practical	Written & Practical Exams
14–15	6	Study, Knowledge & Application (Practical)	Gram-Positive Cocci • Staphylococcus • Streptococcus • Enterococcus	Theoretical + Practical	Written & Practical Exams

11. Course Evaluation

100 marks: 5 Attendance | 25 Monthly Exam Theory | 10 Practical Monthly | 60 Final (25 Theory + 35 Practical).

12. Learning and Teaching Resources

Main References	Logan N.A. et al. (2011). Bacillus and other aerobic endospore-forming bacteria. Manual of Clinical Microbiology, 381–402. Logan N.A. & Rodríguez-Díaz M. (2006). Bacillus spp. and related genera. Principles and Practice of Clinical Bacteriology, 139–158.
Electronic Sources	—



Course Description Form — Medical Bacteriology 2



1. Course Name	Medical Bacteriology 2
2. Course Code	ATU-13-MLT-212-C-ME
3. Semester / Year	Second Semester / Second Year
4. Description Date	2025-12-30
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	6 Study Hours / 4 Units
7. Course Coordinator	Dr. Zahraa Basem Shaker
Email	—

8. Course Objectives

- Familiarize the student with the fundamental scientific concepts of the subject, its theoretical and practical aspects.
- Increase the efficiency and effectiveness of laboratory data analysis.
- Achieve the goals of the Medical Laboratory Techniques Department.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration
- Cooperative learning – Problem solving – Simulation
- Brainstorming – Role-playing
- Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	6	Study, Knowledge & Application (Practical)	Gram-Positive Spore-Forming Bacilli • Clostridium • Bacillus	Theoretical + Practical	Written & Practical Exams
2-4	6	Study, Knowledge & Application (Practical)	Gram-Positive Non-Spore-Forming Bacteria • Listeria • Corynebacterium Gram-Negative Cocci: Neisseria	Theoretical + Practical	Written & Practical Exams
5-6	6	Study, Knowledge & Application (Practical)	Enteric Gram-Negative Rods • E. coli • Klebsiella • Proteus • Pseudomonas • Acinetobacter • Shigella	Theoretical + Practical	Written & Practical Exams
7	6	Study, Knowledge & Application	Enteric Gram-Negative Rods (cont.)	Theoretical + Practical	Written & Practical Exams

		(Practical)	• Salmonella • Yersinia		
8-9	6	Study, Knowledge & Application (Practical)	Fastidious Gram-Negative Bacteria • Haemophilus • Brucella • Bordetella	Theoretical + Practical	Written & Practical Exams
10-11	6	Study, Knowledge & Application (Practical)	Intracellular & Atypical Bacteria • Chlamydia • Mycobacterium (Tuberculosis, Leprosy)	Theoretical + Practical	Written & Practical Exams
12-13	6	Study, Knowledge & Application (Practical)	Spirochetes • Treponema (Syphilis) • Borrelia • Leptospira	Theoretical + Practical	Written & Practical Exams
14-15	6	Study, Knowledge & Application (Practical)	Mycoplasma & Rickettsia • Relate to respiratory and febrile diseases • Identify diagnostic methods	Theoretical + Practical	Written & Practical Exams

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).

12. Learning and Teaching Resources

Main References	Zahraa B. Shaker (2025). Semester / Year: 2025 / 2026. Name: Zahraa Basem Shakir. Standard clinical microbiology textbooks.
Electronic Sources	—





Course Description Form — Descriptive Statistics

1. Course Name	Descriptive Statistics
2. Course Code	ATU-13-MLT-224-C-ME
3. Semester / Year	Second / 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person
6. Credit Hours / Units	2 Theory + 4 Practical / 4 Units
7. Course Coordinator	—
Email	—

8. Course Objectives

- Introduce students to basic statistical concepts applied in medical laboratory sciences.
- Enable students to calculate measures of central tendency (mean, median, mode) and measures of dispersion (variance, standard deviation).
- Introduce statistical analysis methods and their application in interpreting laboratory data.
- Develop the ability to represent data graphically (bar charts, histograms, frequency distributions).

9. Teaching and Learning Strategies

- Lectures | Practical sessions | Problem-solving | Discussion

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1–2	2 Th.+4 Pr.	Understanding the concept and measures	Introduction to Statistics • Definition, types and importance of statistics in health sciences	2 Theory + 4 Practical	Oral & written exams
3–4	2 Th.+4 Pr.	Calculate measures of central tendency	Measures of Central Tendency • Mean • Median • Mode	2 Theory + 4 Practical	Oral & written exams
5–6	2 Th.+4 Pr.	Calculate and interpret measures of dispersion	Measures of Dispersion • Range • Variance • Standard Deviation • Coefficient of Variation	2 Theory + 4 Practical	Oral & written exams
7–8	2 Th.+4 Pr.	Apply probability concepts	Probability Theory • Basic probability rules • Normal distribution	2 Theory + 4 Practical	Oral & written exams
9–10	2 Th.+4 Pr.	Construct and	Frequency	2 Theory + 4	Oral & written

		interpret frequency distributions	Distributions & Data Presentation • Histograms • Bar charts • Pie charts	Practical	exams
11-12	2 Th.+4 Pr.	Perform and interpret statistical tests	Hypothesis Testing • t-test • Chi-square test • Confidence intervals	2 Theory + 4 Practical	Oral & written exams
13-15	2 Th.+4 Pr.	Apply statistics to laboratory data	Statistical Quality Control in Clinical Laboratories • Levey-Jennings charts • Westgard rules	2 Theory + 4 Practical	Oral & written exams Reports

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).

12. Learning and Teaching Resources

Required Textbooks	Biostatistics for the Health Sciences (standard texts)
Electronic Sources	SPSS online tutorials



Course Description Form — Medical Parasitology 1



1. Course Name	Medical Parasitology 1
2. Course Code	ATU-13-MLT-216-C-ME
3. Semester / Year	2025 / 2026 (Semester)
4. Description Date	30-12-2025
5. Attendance Mode	Lectures + Laboratory Practicals
6. Credit Hours / Units	2 Theory + 4 Practical / 4 Units
7. Course Coordinator	Asst. Lect. Safa Khalid Aziz
Email	safaalaboudi6@gmail.com

8. Course Objectives

Knowledge Objectives:

- Know the basic principles for performing stool examinations.
- Be familiar with the stains used in parasitology.
- Identify the most medically important parasites and their pathogenic species.

Practical Skill Objectives:

- Perform direct stool examination and prepare samples using the direct wet-mount technique.
- Distinguish between the different developmental stages of parasites (eggs, cysts, trophozoites, and active forms).
- Perform microscopic differentiation between parasitological specimens.

9. Teaching and Learning Strategies

- Interactive lectures supported by presentation slides
- Classroom discussions and short questions
- Practical training in the laboratory

Assessment Methods: Written exam | Class participation and interaction | Short daily quizzes.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	2 Th.+4 Pr.	General knowledge about parasitology	Introduction to Medical Parasitology • Definition • Types of parasites • Biological significance	Discussion • Short questions	Written exam Participation Short quiz
2-3	2 Th.+4 Pr.	Know types of protozoa	Protozoa – General Features • Entamoeba histolytica •	Discussion • Short questions	Written exam Participation



4-5	2 Th.+4 Pr.	Identify different species	Giardia lamblia • Trichomonas vaginalis Blood & Tissue Protozoa • Plasmodium spp. (Malaria) • Toxoplasma gondii • Leishmania spp.	Presentations • Discussion	Written exam Short quiz
6-7	2 Th.+4 Pr.	Know nematodes (roundworms)	Intestinal Nematodes • Ascaris lumbricoides (Roundworm) • Trichuris trichiura (Whipworm) • Enterobius vermicularis (Pinworm)	Presentations • Discussion	Written exam
8-9	2 Th.+4 Pr.	Identify pathogenic cestodes	Tissue Nematodes • Strongyloides stercoralis • Hookworms • Toxocara species	Presentations • Discussion	Written exam Short quiz
10-11	2 Th.+4 Pr.	Know types of tapeworms	Cestodes (Tapeworms) • Taenia solium • Taenia saginata • Hymenolepis nana • Echinococcus granulosus	Presentations • Discussion	Written exam
12	2 Th.+4 Pr.	Know intestinal threadworm	Intestinal Threadworm (Strongyloides stercoralis) • Life cycle • Diagnosis • Medical importance	Presentations • Oral Q&A	Written exam Short quiz
13	2 Th.+4 Pr.	Know pin worm biology	Pinworm (Enterobius vermicularis) • Life cycle • Diagnosis • Medical importance	Presentations • Discussion	Written exam
14	2 Th.+4 Pr.	Know medical entomology	Medical Entomology • Flies (Diptera, Simulium) • Mosquitoes (Anopheles, Culex, Aedes)	Lecture • Presentation	Daily & written exam
15	2 Th.+4 Pr.	Know medically significant arthropods	Medical Entomology (cont.) • Fleas • Lice – medical importance and types • Mites and ticks	Lecture • Presentation	Daily & written exam

11. Course Evaluation

100 marks: 25 Theory Monthly + 10 Practical Monthly + 5 Evaluation + Final (35 Theory + 25 Practical).

12. Learning and Teaching Resources

Required Textbooks	Paniker – Medical Parasitology Mahmud – Medical Parasitology Atlas of Medical Parasitology
Electronic Sources	—





Course Description Form — Clinical Biochemistry

1. Course Name	Clinical Biochemistry
2. Course Code	ATU-13-MLT-223-C-ME
3. Semester / Year	Second / Second Year
4. Description Date	30-12-2025
5. Attendance Mode	In-Person
6. Credit Hours / Units	2 / 2
7. Course Coordinator	Dr. Bishayr Hashim Ahmed
Email	—

8. Course Objectives

- Introduce students to the principles of clinical biochemistry and how biochemical tests are performed and interpreted.
- Enable students to understand biochemical pathways and their relation to disease.
- Develop laboratory skills in performing common biochemical tests (glucose, urea, lipid profile, enzymes, etc.).

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration
- Cooperative learning – Problem solving – Simulation
- Brainstorming – Role-playing
- Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1–2	2 Th.+4 Pr.	Study, Knowledge & Application	Introduction to Clinical Biochemistry • Scope and importance in medical laboratory diagnosis	Theoretical + Practical	Written & Practical Exams
3–4	2 Th.+4 Pr.	Study, Knowledge & Application	Carbohydrate Metabolism & Clinical Disorders • Diabetes mellitus • Glucose tolerance test	Theoretical + Practical	Written & Practical Exams
5–6	2 Th.+4 Pr.	Study, Knowledge & Application	Lipid Metabolism & Lipid Profile • Total cholesterol • Triglycerides • HDL/LDL	Theoretical + Practical	Written & Practical Exams

7-8	2 Th.+4 Pr.	Study, Knowledge & Application	Protein Metabolism & Kidney Function Tests • Urea • Creatinine • Uric acid	Theoretical + Practical	Written & Practical Exams
9-10	2 Th.+4 Pr.	Study, Knowledge & Application	Liver Function Tests • AST • ALT • ALP • Bilirubin • Albumin	Theoretical + Practical	Written & Practical Exams
11-12	2 Th.+4 Pr.	Study, Knowledge & Application	Cardiac Markers & Enzymes • CK-MB • Troponin • LDH	Theoretical + Practical	Written & Practical Exams
13-15	2 Th.+4 Pr.	Study, Knowledge & Application	Electrolytes & Acid-Base Balance • Na ⁺ , K ⁺ , Cl ⁻ , HCO ₃ ⁻ • Blood pH • Arterial blood gases	Theoretical + Practical	Written & Practical Exams

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).

12. Learning and Teaching Resources

Main References	Standard clinical biochemistry texts
Electronic Sources	—





Course Description Form — Arabic Language 2

1. Course Name	Arabic Language 2
2. Course Code	ATU-13-MLT-225-C-ME
3. Semester / Year	Second Semester / Second Year
4. Description Date	30-12-2025
5. Attendance Mode	In-Person
6. Credit Hours / Units	2 / 2
7. Course Coordinator	Dr. Bishayr Hashim Ahmed
Email	—

8. Course Objectives

- Teach students how to read correct standard Arabic (Modern Standard Arabic).
- Develop students' ability in advanced Arabic grammar and parsing.
- Enable students to write formal academic Arabic texts.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration
- Cooperative learning – Problem solving – Simulation
- Brainstorming – Role-playing
- Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1–2	2 Th.	Student recognizes parts of speech	Parts of Speech Review • Introduction to the Ta-Marbuta, Ta-Taweela	Lecture delivery & Q&A	Written & oral exams Written attendance
3–4	2 Th.	Student understands nouns and their forms	Noun and Its Markers • Types of nouns • Singular, dual, plural	Lecture delivery & Q&A	Written & oral exams
5–6	2 Th.	Student understands verb conjugation	Verb: Forms and Markers • Past, present, and imperative verb forms	Lecture delivery & Q&A	Written & oral exams
7–8	2 Th.	Student performs grammatical parsing	Grammatical Analysis (إعراب والبناء) • Sentence structure • Subject and predicate	Lecture delivery & Q&A	Written & oral exams
9–10	2 Th.	Student identifies case endings	Case Endings and Their Markers	Lecture delivery & Q&A	Written & oral exams

			• Nominative, Accusative, Genitive cases		
11-12	2 Th.	Student identifies indeclinable nouns	Indeclinable Nouns (الاسماء المبنية) • Pronouns • Demonstrative nouns • Relative nouns	Lecture delivery & Q&A	Written & oral exams
13-15	2 Th.	Application and composition	Academic Arabic Writing • Medical report writing in Arabic	Lecture • Discussion	Written & oral exams

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).





Course Description Form — Molecular Biology

1. Course Name	Molecular Biology
2. Course Code	ATU-13-MLT-215-C-ME
3. Semester / Year	First Semester / Second Year
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	4 / 4
7. Course Coordinator	Asst. Lect. Dr. Rua Muhammad Hussein
Email	—

8. Course Objectives

- Familiarize the student with the fundamental scientific concepts of the subject, its theoretical and practical aspects.
- Increase the efficiency and effectiveness of laboratory data analysis.
- Achieve the goals of the Medical Laboratory Techniques Department.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration
- Cooperative learning – Problem solving – Simulation
- Brainstorming – Role-playing
- Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1-2	6	Study, Knowledge & Application (Practical)	Introduction to Molecular Biology • Structure of DNA & RNA • DNA as the vehicle of inheritance • Central dogma of molecular biology	Theoretical + Practical	Written & Practical Exams
3-5	6	Study, Knowledge & Application (Practical)	DNA Replication and Transcription • DNA polymerase and replication machinery • Transcription factors and mRNA synthesis	Theoretical + Practical	Written & Practical Exams
6-7	6	Study, Knowledge & Application	Gene Expression and Regulation • Promoters •	Theoretical + Practical	Written & Practical Exams

		(Practical)	Operons (lac, trp) • Gene silencing		
8	6	Study, Knowledge & Application (Practical)	Post-Transcriptional Modification • RNA splicing • mRNA capping and polyadenylation	Theoretical + Practical	Written & Practical Exams
9–10	6	Study, Knowledge & Application (Practical)	Translation (Protein Synthesis) • Ribosomes • tRNA • Codons • Anticodons	Theoretical + Practical	Written & Practical Exams
11–12	6	Study, Knowledge & Application (Practical)	Molecular Techniques • PCR and RT-PCR • Gel electrophoresis • DNA sequencing (Sanger)	Theoretical + Practical	Written & Practical Exams
13–15	6	Study, Knowledge & Application (Practical)	Recombinant DNA Technology • Cloning vectors • Restriction enzymes • Applications in medicine and diagnostics	Theoretical + Practical	Written & Practical Exams

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).

12. Learning and Teaching Resources

Required Textbooks	Molecular Biology of the Cell, 4th Ed. – Alberts B, Johnson A, Lewis J, et al. New York: Garland Science; 2002. Practical Guide to Biochemistry and Molecular Biology – Gerald D. Fasman.
Main References	Molecular Biology Techniques: A Laboratory Coursebook (Manoa) National Center for Biotechnology Information (NCBI)
Electronic Sources	YouTube educational channels NCBI Online Resources





Course Description Form — Computer Applications 1

1. Course Name	Computer Applications 1
2. Course Code	ATU-13-MLT-214-C-ME
3. Semester / Year	Second / Second Year
4. Description Date	30-12-2025
5. Attendance Mode	In-Person
6. Credit Hours / Units	2 / 2
7. Course Coordinator	Asst. Lect. Ahmed Taklif
Email	—

8. Course Objectives

- Gain comprehensive understanding of the computer science laboratory environment including hardware components, operating systems, and basic software.
- Enable students to use word processing and spreadsheet applications efficiently.
- Develop skills in saving, opening files, and managing data across multiple worksheets.

9. Teaching and Learning Strategies

- Lecture delivery | Practical lab application | Discussion | Brainstorming

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1-2	2 Th.+2 Pr.	Understanding the lecture content	Microsoft Word – Advanced Features • Document formatting • Tables • Mail merge	Lecture + Practical	Written & practical exams
3-4	2 Th.+2 Pr.	Understanding the lecture content	Microsoft Excel – Introduction • Spreadsheet concept • Data types • Cell references	Lecture + Practical	Written & practical exams
5	1 Pr.	Applying calculator functions	Microsoft Excel – Formulas & Functions • Calculator applications • SUM, AVERAGE, COUNT	Practical lab	Practical exam
6-7	2 Th.+2 Pr.	Understanding the lecture content	Saving and Opening Files • Multiple worksheets • Data sharing formats	Lecture + Practical	Written & practical exams



Course Description Form — Physiology (Theoretical)

1. Course Name	Physiology – Theoretical (مادة الفسلجة النظري)
2. Course Code	ATU-13-MLT-213-C-ME
3. Semester / Year	2025 / 2026 (Semester)
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (100%)
6. Credit Hours / Units	30 Hours (2 hours/week) / Theory Only
7. Course Coordinator	Dr. Abdulsamed Aliyori Hassan
Email	samadovaabditch@atu.edu.iq

8. Course Objectives

Knowledge Objectives:

- Understand the theoretical curriculum components of physiology.
- Understand the rules and principles of human physiology.
- Understand the causes and diseases of each organ of the body.

Skill Objectives:

- Understand the fundamentals of physiology.
- Connect physiology with the anatomy covered in the same curriculum.
- Know the diagnostic methods for conditions related to physiology.

9. Teaching and Learning Strategies

- Theoretical lectures
- Foreign university video clips to explain the curriculum
- Review of references and relevant books

Assessment Methods: Formative assessment | Q&A | Exams.

10. Course Structure — Semester 1

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1–2	2 Th.	Understand the lecture	Introduction to Human Physiology • Definition • Levels of organization • Homeostasis and feedback systems	Lecture • Blackboard • Visual aids	Written & oral exams
3–4	2 Th.	Understand cell physiology	Cell Physiology • Cell membrane transport • Osmosis • Diffusion •	Lecture • Visual aids	Written & oral exams



5-6	2 Th.	Understand nervous system physiology	Active transport Nervous System Physiology • Action potentials • Synaptic transmission • Autonomic nervous system	Lecture • Visual aids	Written & oral exams
7-8	2 Th.	Understand muscle physiology	Muscle Physiology • Skeletal, smooth, and cardiac muscle • Neuromuscular junction • Muscle contraction	Lecture • Visual aids	Written & oral exams
9-10	2 Th.	Understand cardiovascular physiology	Cardiovascular Physiology • Cardiac cycle • Blood pressure • Heart rate • ECG basics	Lecture • Visual aids	Written & oral exams
11-12	2 Th.	Understand respiratory physiology	Respiratory Physiology • Ventilation • Gas exchange • Oxygen and CO ₂ transport • Acid-base regulation	Lecture • Visual aids	Written & oral exams
13-15	2 Th.	Understand renal physiology	Renal Physiology • Glomerular filtration • Tubular reabsorption and secretion • Urine concentration	Lecture • Visual aids	Written & oral exams

10b. Course Structure — Semester 2

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1-3	2 Th.	Understand GI physiology	Gastrointestinal Physiology • Digestion and absorption • GI motility • GI hormones	Lecture • Visual aids	Written & oral exams
4-6	2 Th.	Understand endocrine physiology	Endocrine System • Hypothalamus-pituitary axis • Thyroid • Adrenal glands • Pancreas	Lecture • Visual aids	Written & oral exams
7-9	2 Th.	Understand reproductive physiology	Reproductive Physiology • Male & female reproductive systems	Lecture • Visual aids	Written & oral exams

10-12	2 Th.	Understand sensory physiology	• Menstrual cycle • Fertilization Special Sense Physiology • Vision • • Hearing • Taste • Smell • Touch	Lecture • Whiteboard • Visual aids	Written & oral exams
13-15	2 Th.	Understand blood physiology	Blood Physiology • Hematopoiesis • Hemostasis • • Blood groups • Coagulation cascade	Lecture • Visual aids	Written & oral exams

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).





Course Description Form — Medical Bacteriology – Laboratory Practical

1. Course Name	Medical Bacteriology – Laboratory Practical
2. Course Code	ATU-13-MLT-221-C-ME
3. Semester / Year	2025 / 2026 (Semester)
4. Description Date	2025-12-30
5. Attendance Mode	Classroom + Lab
6. Credit Hours / Units	6 hours / 4 Units
7. Course Coordinator	Zahraa Basem Shaker
Email	—

8. Course Objectives

- Develop the skill of culturing bacteria on different culture media.
- Linking laboratory results with medical diagnosis.
- Prepare the student to work in medical microbiology laboratories.
- Identify pathogenic bacteria through morphological, biochemical and cultural characteristics.
- Relate bacterial sensitivity testing to appropriate antibiotic treatment.

9. Teaching and Learning Strategies

- Lectures and practical lessons | Outcome-based learning | Project-based learning | Group work | Problem-based learning | Community-based learning | Self-learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	1	Describe bacterial cell components and functions	Safe Laboratory and Skilled Laboratory Safety • Introduction to microbiology lab safety	Lectures + Practical	Theory & Practical Exams
2	1	Identify and select the clinical sample	Clinical Sample Collection & Processing • Types of clinical samples • Inoculation techniques	Lectures + Practical	Theory & Practical Exams
3	1	Perform Gram staining and identify bacteria	Gram Staining Technique • Procedure • Interpretation of results	Lectures + Practical	Theory & Practical Exams
4	1	Identify culture media types	Culture Media • Nutrient agar • Blood agar • MacConkey agar • Selective and	Lectures + Practical	Theory & Practical Exams



5	1	Understand bacterial physiology concepts	differential media Bacterial Growth Characteristics • Colonial morphology • Hemolysis patterns	Lectures + Practical	Theory & Practical Exams
6	1	Describe bacterial virulence factors	Bacterial Virulence Factors and Pathogenesis • Exotoxins • Endotoxins • Capsules	Lectures + Practical	Theory & Practical Exams
7-8	1	Relate antibiotic sensitivity to treatment	Antibiotic Sensitivity Testing • Disk diffusion (Kirby-Bauer) • MIC determination	Lectures + Practical	Theory & Practical Exams
9-10	1	Identify Staphylococcus characteristics	Staphylococcus • S. aureus – Catalase, Coagulase tests • Differentiate species	Lectures + Practical	Theory & Practical Exams
11	1	Identify Streptococcus characteristics	Streptococcus • Classification by hemolysis • Lancefield grouping • Streptococcus vs. Enterococcus	Lectures + Practical	Theory & Practical Exams
12-13	1	Identify Clostridium & Bacillus	Gram-Positive Spore-Forming Bacilli • Clostridium (tetanus, botulism) • Toxin production	Lectures + Practical	Theory & Practical Exams
14	1	Identify Chlamydia & Mycobacterium	Intracellular Bacteria • Chlamydia – genital and ocular infections • Mycobacterium – Acid-fast stain	Lectures + Practical	Theory & Practical Exams
15	1	Identify Mycoplasma characteristics	Mycoplasma • Relate to respiratory and febrile diseases • Identify diagnostic methods	Lectures + Practical Brainstorming	Theory & Practical Exams

11. Course Evaluation

Distributed out of 100: Daily preparation | Daily oral exams | Monthly exams | Written exams | Reports.



Course Description Form — Histology

1. Course Name	Histology
2. Course Code	ATU-13-MLT-222-C-ME
3. Semester / Year	First & Second Semester / Second Year
4. Description Date	30-12-2025
5. Attendance Mode	In-Person
6. Credit Hours / Units	6 Hours/Week / 4 Units
7. Course Coordinator	Asst. Lect. Hussein Sittar Ribat (hussaein.rebat@atu.edu.iq) Co-instructor: Dr. Hanin Hussein Muhammad
Email	hussaein.rebat@atu.edu.iq

8. Course Objectives

Knowledge Objectives:

- Understand tissue structure.
- Study tissue functions.
- Identify basic cell types and classify tissues based on cell morphology and function for the basic tissues of those organs.

Skill Objectives:

- Develop microscopy examination skills.
- Identify tissue types and cells microscopically.
- Apply histological techniques.

9. Teaching and Learning Strategies

- Theoretical and practical learning
- Self-directed learning
- Learning using multiple multimedia educational platforms

Assessment Methods: Exams and Assignments | Research Projects | Discussions.

10. Course Structure — Semester 1

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	6	Understanding the importance of histology	Introduction to Histology • Importance of histology in medicine • Tissue classification • Histological section preparation using	Lectures + Practical • Self-learning	Exams & Assignments Research Projects Discussions



2	6	Knowledge of cell components and their functions	multimedia • Learning with histology slides Cell Components and Functions • Nucleus • Cytoplasm • Organelles • Cell membrane	Lectures + Practical • Self-learning	Exams & Assignments Discussions
3-4	6	Know types of epithelial tissue	Epithelial Tissue • Simple, stratified, pseudostratified epithelia • Functions and locations	Lectures + Practical • Self-learning	Exams & Assignments Discussions
5-6	6	Know connective tissue components	Connective Tissue • Types: loose, dense, specialized • Fibers (collagen, elastic, reticular) • Cells (fibroblasts, mast cells, macrophages)	Lectures + Practical • Self-learning	Exams & Assignments Discussions
7-8	6	Know muscular tissue types	Muscular Tissue • Skeletal • Cardiac • Smooth muscle histology	Lectures + Practical • Self-learning	Exams & Assignments Discussions
9	6	Know nervous tissue components	Nervous Tissue • Neurons • Glial cells • Synapses	Lectures + Practical • Self-learning	Exams & Assignments Discussions
10-12	6	Know blood and lymphoid tissue	Blood and Lymphoid Tissue • RBCs • WBCs • Platelets • Bone marrow • Lymph nodes • Thymus • Spleen	Lectures + Practical • Self-learning	Exams & Assignments Research Projects
13-15	6	Know cardiovascular histology	Cardiovascular System Histology • Heart • Arteries • Veins • Capillaries • Lymphatic vessels	Lectures + Practical • Self-learning	Exams & Assignments Discussions

10b. Course Structure — Semester 2

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1-3	6	Know digestive system histology	Gastrointestinal Tract Histology • Esophagus • Stomach • Small intestine • Large intestine • Liver • Pancreas •	Lectures + Practical • Self-learning	Exams & Assignments Discussions



4-6	6	Know respiratory histology	Gallbladder Respiratory System Histology • Trachea • Bronchi • Alveoli • Nasal mucosa	Lectures + Practical • Self-learning	Exams & Assignments Discussions
7-9	6	Know urinary system histology	Urinary System Histology • Kidney (cortex, medulla, glomerulus) • Collecting tubules • Urinary bladder	Lectures + Practical • Self-learning	Exams & Assignments Discussions
10-12	6	Know reproductive system histology	Reproductive System Histology • Testis • Ovary • Uterus • Placenta	Lectures + Practical • Self-learning	Exams & Assignments Research Projects
13	6	Know skin structure	Skin (Integumentary System) • Epidermis • Dermis • Hypodermis • Skin appendages (hair, nails, glands)	Lectures + Practical • Self-learning	Exams & Assignments Discussions
14-15	6	Know endocrine gland histology	Endocrine Gland Histology • Pituitary • Thyroid • Parathyroid • Adrenal • Pineal	Lectures + Practical • Self-learning	Exams & Assignments Discussions

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).

12. Learning and Teaching Resources

Required Textbooks	Pathologic Basis of Diseases, 8th Ed. (2012) Junqueira's Basic Histology, 15th Ed. (2018)
Electronic Sources	—



THIRD YEAR — COURSE DESCRIPTIONS

Department of Medical Laboratory Techniques | 2025–2026

Course Description Form — Metabolic Disorders (Clinical Biochemistry – Advanced)

1. Course Name	Metabolic Disorders
2. Course Code	ATU-13-MLT-314-C-ME
3. Semester / Year	Semester 2 / Third Year 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	1. On-Campus (Face-to-Face): Attendance at theoretical and practical lectures in classrooms and labs. 2. Asynchronous Online: Educational materials (videos, files, recorded lectures) available to students at any time. 3. Laboratory Practical: Students attend biochemistry labs to perform experiments and practical training.
6. Credit Hours / Units	30 hours total / 4 Units (2 Theory + 4 Practical)
7. Course Coordinator	Dr. Fahad Fahad
Email	fahad.fahad@atu.edu.iq

8. Course Objectives

Knowledge Objectives:

- Introduce students to the fundamental principles related to metabolic disorders in clinical chemistry and how to identify them.
- Understand the diseases associated with clinical biochemistry and their theoretical basis and how to diagnose them.
- Understand how a disease develops, its causes, and ways to diagnose it clinically.

Practical and Technical Skill Objectives:

- Understand the external factors that lead to disease appearance.
- Apply theoretical and practical laboratory diagnostic methods using modern equipment (spectrophotometry, MINI VIDAS).
- Develop student skill in performing hormonal investigations accurately and safely.
- Enable students to follow lab safety and biosafety procedures inside the laboratory.
- Develop students' ability to record results and analyze them statistically.
- Strengthen students' ability to solve problems faced during experiments or clinical examinations.

9. Teaching and Learning Strategies

- Interactive lectures: to explain theoretical concepts linked with clinical applications.
- Practical laboratory training: to train students in performing lab investigations using equipment accurately and safely.



- Problem-based learning: through discussing clinical cases and analyzing lab results.
- Cooperative learning: through small-group teamwork and developing communication and teamwork skills.
- Short projects and reports: to develop scientific research skills, result analysis, and scientific writing.

Assessment Methods:

- Semester and final exams to measure theoretical and knowledge aspects.
- Practical performance evaluation: assessing student performance in the laboratory, recording results, and writing reports.
- Practical exams (Practical Exams): to assess hormonal examination skills.
- Class participation and discussions: to assess interaction and student understanding.
- Short projects and reports: to assess scientific research and analytical writing skills.

10. Course Structure — Semester 2

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	2 Th.+4 Pr.	1. Introduce endocrinology, quality control in lab, types of hormones. 2. Know types of assay mechanisms for hormones. 3. Apply lab safety and use personal protective equipment correctly during lab work. 4. Commitment to professionalism and teamwork when handling specimens and laboratory data.	Introduction to Endocrinology • Quality control rules • Types of hormones and their classifications • Applied lab safety	Interactive lectures with visual presentations and illustrative designs. • Clinical case discussions for applying theoretical knowledge. • Practical sessions using laboratory equipment. • Interactive simulations of laboratory pathways and analyses.	Theoretical: multiple choice, essay questions, case studies, short questions, report writing. Practical: lab performance evaluation, laboratory reports, short quizzes. Periodic reviews: short quizzes to follow up on each unit.
2–3	2 Th.+4 Pr.	1. Know types of mechanisms of hormone action. 2. Understand the biochemical mechanisms of each type of hormone. 3. Know the stimulators and inhibitors specific to each type of hormone.	Mechanisms of Hormone Action • Receptor types: membrane, cytoplasmic, nuclear • Signal transduction pathways • Hormone stimulators and inhibitors	Interactive lectures • Clinical case discussions • Practical simulations	Theory & Practical Exams Lab Reports • Periodic Reviews
4–6	2 Th.+4 Pr.	Understand pituitary gland hormones and their clinical significance	Pituitary Gland Hormones • Anterior: GH, TSH, LH, FSH, ACTH, Prolactin • Posterior: ADH, Oxytocin	Interactive lectures • Practical lab sessions Clinical case discussions	Theory & Practical Exams Lab Reports



			• Clinical disorders: acromegaly, dwarfism, hypopituitarism		
7-9	2 Th.+4 Pr.	Understand thyroid gland biochemistry and disorders	Thyroid Gland Hormones • T3, T4, TSH • Synthesis and regulation • Hypothyroidism • Hyperthyroidism • Hashimoto's disease • Laboratory assessment: TFT panel	Interactive lectures • Practical lab sessions Clinical case discussions	Theory & Practical Exams Lab Reports
10-12	2 Th.+4 Pr.	Understand adrenal gland biochemistry and disorders	Adrenal Gland Hormones • Cortex: Cortisol, Aldosterone, DHEA • Medulla: Epinephrine, Norepinephrine • Cushing's syndrome • Addison's disease • Pheochromocytoma	Interactive lectures • Practical lab sessions	Theory & Practical Exams
13-15	2 Th.+4 Pr.	Understand pancreatic hormones and glucose metabolism disorders	Pancreatic Hormones & Metabolic Disorders • Insulin • Glucagon • Diabetes mellitus (Type 1 & 2) • Glucose tolerance test • HbA1c • Insulin resistance	Interactive lectures • Practical lab sessions Clinical case discussions	Theory & Practical Exams Lab Reports Final Review

11. Course Evaluation

Distributed out of 100: 40% Continuous Assessment (theory + practical monthly) + 60% Final Exam (theory + practical).



Course Description Form — Tissue Pathology

1. Course Name	Tissue Pathology (Pathology – علم الأمراض النسيجية)
2. Course Code	ATU-13-MLT-311-C-ME
3. Semester / Year	Semester 1 / Third Year 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	Classroom + Laboratory
6. Credit Hours / Units	4 hours / 3 Units
7. Course Coordinator	Asst. Lect. Abbas Hussein Obaid
Email	abbas.obaid@atu.edu.iq

8. Course Objectives

Knowledge Objectives:

- Provide students with a comprehensive and up-to-date understanding of pathological science to enable them to keep up with the medical community after graduation.

Practical/Technical Skill Objectives:

- Establish a solid knowledge base on pathology and modern techniques.
- Enable the student to identify and analyze pathological specimens under the microscope.
- Train students in the preparation and processing of histopathological slides.

9. Teaching and Learning Strategies

- Lectures for explaining theoretical concepts.
- Laboratory sessions for practical applications.
- Group discussions to enhance critical thinking.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1–2	4	Understand cell injury mechanisms	Cell Injury, Adaptation, and Death • Reversible and irreversible injury • Necrosis vs. apoptosis • Cellular adaptation (atrophy, hypertrophy, hyperplasia, metaplasia)	Lectures + Lab	Theory & Practical Exams
3–4	4	Understand inflammation	Inflammation and Repair • Acute and chronic inflammation • Mediators of	Lectures + Lab	Theory & Practical Exams



5-6	4	Understand vascular pathology	inflammation • Wound healing • Fibrosis Vascular Pathology • Thrombosis • Embolism • Infarction • Shock • Edema	Lectures + Lab	Theory & Practical Exams
7-8	4	Understand neoplasia	Neoplasia • Benign vs. malignant tumors • Tumor grading and staging • Carcinogenesis • Tumor markers	Lectures + Lab	Theory & Practical Exams
9-10	4	Understand cardiovascular pathology	Cardiovascular Pathology • Atherosclerosis • Myocardial infarction • Cardiomyopathy • Valvular diseases	Lectures + Lab	Theory & Practical Exams
11-12	4	Understand respiratory pathology	Respiratory Pathology • Lung (chronic bronchitis, pulmonary embolism) • Pneumonia • Tuberculosis • Lung cancer	Lectures + Lab	Theory & Practical Exams
13	4	Understand GI pathology	Gastrointestinal Pathology • Peptic ulcers • Crohn's disease • Large intestine tumors • Liver cirrhosis • Hepatocellular carcinoma	Lectures + Lab	Theory & Practical Exams
14	4	Understand endocrine pathology	Endocrine Pathology • Thyroiditis • Thyroid neoplasms • Diabetes complications • Adrenal pathology	Lectures + Lab	Theory & Practical Exams
15	4	Understand renal & urinary pathology	Renal Pathology • Glomerulonephritis • Nephrotic syndrome • Renal tumors	Lectures + Lab	Theory & Practical Exams

11. Course Evaluation

Distributed out of 100: 40% Course Work (theory + practical monthly) | 60% Final Exam.

12. Learning and Teaching Resources

Required Textbooks	Pathologic Basis of Diseases, 8th Ed. (2012) Junqueira's Basic Histology, 15th Ed. (2018)
Electronic Sources	—



Course Description Form — Virology

1. Course Name	Virology (الفايروسات)
2. Course Code	ATU-13-MLT-323-C-ME
3. Semester / Year	Third Year 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	4 / 4
7. Course Coordinator	Dr. Hassan Aqeel Majeed
Email	—

8. Course Objectives

- Familiarize the student with the fundamental scientific concepts of the subject, its theoretical and practical aspects.
- Increase the efficiency and effectiveness of laboratory data analysis.
- Achieve the goals of the Medical Laboratory Techniques Department.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration
- Cooperative learning – Problem solving – Simulation
- Brainstorming – Role-playing
- Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	4	Study, Knowledge & Application (Practical)	General Properties of Viruses • Structure, Classification and Nomenclature of Viruses	Theoretical + Practical	Theory & Practical Exams
2	4	Study, Knowledge & Application (Practical)	Viral Replication • Attachment, penetration, uncoating, biosynthesis, assembly, release	Theoretical + Practical	Theory & Practical Exams
3	4	Study, Knowledge & Application (Practical)	Pathogenesis of Viral Infections • Types of viral infections • Host immune responses	Theoretical + Practical	Theory & Practical Exams
4	4	Study, Knowledge & Application (Practical)	Adeno- and Parvoviruses • Structure • Diseases •	Theoretical + Practical	Theory & Practical Exams



			Diagnosis • Prevention		
5	4	Study, Knowledge & Application (Practical)	Arboviruses (Arthropod-Borne Viruses) • Dengue • Zika • West Nile virus • Yellow fever	Theoretical + Practical	Theory & Practical Exams
6	4	Study, Knowledge & Application (Practical)	Oncogenic Viruses • HPV • HBV • EBV • HTLV • Mechanism of viral carcinogenesis	Theoretical + Practical	Theory & Practical Exams
7	4	Study, Knowledge & Application (Practical)	Bacteriophages (Bacterial Viruses) • Lytic vs. lysogenic cycles • Importance in molecular biology	Theoretical + Practical	Theory & Practical Exams
8	4	Study, Knowledge & Application (Practical)	Antiviral Drugs & Viral Vaccines • Mechanisms of antiviral action • Types of vaccines • Immunization schedules	Theoretical + Practical	Theory & Practical Exams
9–10	4	Study, Knowledge & Application (Practical)	Herpesviruses • HSV-1, HSV-2 • VZV (Varicella) • EBV • CMV • Disease manifestations and diagnosis	Theoretical + Practical	Theory & Practical Exams
11–12	4	Study, Knowledge & Application (Practical)	Respiratory Viruses • Influenza A and B • RSV • Rhinovirus • COVID-19 (SARS-CoV-2)	Theoretical + Practical	Theory & Practical Exams
13–14	4	Study, Knowledge & Application (Practical)	Hepatitis Viruses • HAV, HBV, HCV, HDV, HEV • Serological markers • Laboratory diagnosis	Theoretical + Practical	Theory & Practical Exams
15	4	Study, Knowledge & Application (Practical)	Retroviruses • HIV Structure and Life Cycle • Pathogenesis of AIDS • Antiretroviral therapy • CD4 count and viral load	Theoretical + Practical	Theory & Practical Exams

11. Course Evaluation



Course Description Form — Medical Mycology

1. Course Name	Medical Mycology (الفطريات)
2. Course Code	ATU-13-MLT-313-C-ME
3. Semester / Year	Third Year 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	4 / 4
7. Course Coordinator	Asst. Lect. Haider Al-Muzaffar
Email	—

8. Course Objectives

- Familiarize the student with the fundamental scientific concepts of the subject, its theoretical and practical aspects.
- Increase the efficiency and effectiveness of laboratory data analysis.
- Achieve the goals of the Medical Laboratory Techniques Department.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration
- Cooperative learning – Problem solving – Simulation
- Brainstorming – Role-playing
- Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1–2	4	Study, Knowledge & Application (Practical)	Introduction to Medical Mycology • History and Epidemiology of Medical Mycology • Importance of fungi in medicine	Theoretical + Practical	Theory & Practical Exams
3	4	Study, Knowledge & Application (Practical)	Morphology, Classification and Reproduction of Pathogenic Fungi • Hyphae • Spores • Yeasts vs. molds • Dimorphic fungi	Theoretical + Practical	Theory & Practical Exams
4–5	4	Study, Knowledge & Application (Practical)	Superficial Mycoses • Tinea types (tinea capitis, corporis, pedis, unguium, cruris) • Dematiaceous fungi (black fungi) • Pityriasis versicolor	Theoretical + Practical	Theory & Practical Exams
6–7	4	Study,	Cutaneous and	Theoretical +	Theory &



		Knowledge & Application (Practical)	Subcutaneous Mycoses • Dermatophytes: Trichophyton, Microsporum, Epidermophyton • Sporotrichosis • Mycetoma • Chromoblastomycosis	Practical	Practical Exams
8-9	4	Study, Knowledge & Application (Practical)	Opportunistic Fungal Infections • Candida (candidiasis) • Aspergillus (aspergillosis) • Cryptococcus (cryptococcosis) • Mucormycosis	Theoretical + Practical	Theory & Practical Exams
10-11	4	Study, Knowledge & Application (Practical)	Systemic (Dimorphic) Fungi • Histoplasma • Coccidioides • Blastomyces • Paracoccidioides • Laboratory identification methods	Theoretical + Practical	Theory & Practical Exams
12-13	4	Study, Knowledge & Application (Practical)	Laboratory Diagnosis of Fungal Infections • Direct microscopy (KOH, Gram, India ink) • Culture media (SDA, CHROMagar) • Antifungal susceptibility testing	Theoretical + Practical	Theory & Practical Exams
14-15	4	Study, Knowledge & Application (Practical)	Antifungal Agents • Azoles • Polyenes • Echinocandins • Allylamines • Mechanism of action • Drug resistance	Theoretical + Practical	Theory & Practical Exams

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).



Course Description Form — Immunology 1

1. Course Name	Immunology 1 (علم المناعة 1)
2. Course Code	ATU-13-MLT-316-C-ME
3. Semester / Year	Third Year 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	4 / 4
7. Course Coordinator	Dr. Qais Khedhir Abd Abbas
Email	Kais.alhadrawi@atu.edu.iq

8. Course Objectives

- Familiarize the student with the fundamental scientific concepts of the subject, its theoretical and practical aspects.
- Increase the efficiency and effectiveness of laboratory data analysis.
- Achieve the goals of the Medical Laboratory Techniques Department.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration
- Cooperative learning – Problem solving – Simulation
- Brainstorming – Role-playing
- Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	4	Study, Knowledge & Application (Practical)	Introduction to Immunology • Definition and classification of immunity • Natural and acquired immunity • Defense factors • Natural (innate) immunity	Theoretical + Practical	Theory & Practical Exams
2–3	4	Study, Knowledge & Application (Practical)	Acquired (Adaptive) Immunity • Humoral immunity (B cells, antibodies) • Cell-mediated immunity (T cells) • MHC molecules (Class I and II)	Theoretical + Practical	Theory & Practical Exams
4–5	4	Study, Knowledge & Application	Antigens and Antibodies • Antigen structure	Theoretical + Practical	Theory & Practical Exams



6-7	4	(Practical) Study, Knowledge & Application (Practical)	- and properties - Antibody classes (IgG, IgM, IgA, IgE, IgD) - Antigen-antibody reactions - Complement System - Classical, lectin, and alternative pathways - Complement activation and biological effects - Role in immune defense	Theoretical + Practical	Theory & Practical Exams
8-9	4	Study, Knowledge & Application (Practical)	- Cytokines and Immunomodulation - Interleukins - Interferons - Tumor necrosis factors - Colony-stimulating factors	Theoretical + Practical	Theory & Practical Exams
10-11	4	Study, Knowledge & Application (Practical)	- Hypersensitivity Reactions (Types I-IV) - Type I (IgE-mediated, Allergy) - Type II (Cytotoxic) - Type III (Immune complex) - Type IV (Delayed/Cell-mediated)	Theoretical + Practical	Theory & Practical Exams
12-13	4	Study, Knowledge & Application (Practical)	- Autoimmunity - Mechanisms of autoimmunity - SLE - Rheumatoid arthritis - Type 1 diabetes - Multiple sclerosis	Theoretical + Practical	Theory & Practical Exams
14-15	4	Study, Knowledge & Application (Practical)	- Immunodeficiency Disorders - Primary (congenital) immunodeficiencies - Secondary immunodeficiencies (HIV/AIDS, malnutrition)	Theoretical + Practical	Theory & Practical Exams

11. Course Evaluation

100 marks: First semester = 10 Theory monthly + 10 Practical monthly = 20 | Second semester = 10 Theory monthly + 10 Practical monthly = 20 | Final exam = 60.



Course Description Form — Hematology 1

1. Course Name	Hematology 1 / Blood Diseases 1 (مراض الدم 1)
2. Course Code	ATU-13-MLT-312-C-ME
3. Semester / Year	Third Year 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	4 / 4
7. Course Coordinator	Dr. Kadhim Muhammad Sabea (Kadham)
Email	—

8. Course Objectives

- Familiarize the student with the fundamental scientific concepts of the subject, its theoretical and practical aspects.
- Increase the efficiency and effectiveness of laboratory data analysis.
- Achieve the goals of the Medical Laboratory Techniques Department.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration
- Cooperative learning – Problem solving – Simulation
- Brainstorming – Role-playing
- Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	4	Study, Knowledge & Application (Practical)	Introduction to Hematology • Definition, importance, and general functions of blood components	Theoretical + Practical	Theory & Practical Exams
2–3	4	Study, Knowledge & Application (Practical)	Hematopoiesis & Erythropoiesis • Morphology of RBCs • Cell membrane structure • RBC metabolism • Hematopoiesis in bone marrow	Theoretical + Practical	Theory & Practical Exams
4–5	4	Study, Knowledge & Application (Practical)	Hemoglobin Structure and Function • Types of hemoglobin • Oxygen and CO ₂ transport	Theoretical + Practical	Theory & Practical Exams



			• Hemoglobin disorders: sickle cell, thalassemia		
6-7	4	Study, Knowledge & Application (Practical)	Anemia – Classification and Laboratory Diagnosis • Iron-deficiency anemia • Megaloblastic anemia (B12, folate) • Aplastic anemia • Hemolytic anemia	Theoretical + Practical	Theory & Practical Exams
8-9	4	Study, Knowledge & Application (Practical)	White Blood Cells (Leukocytes) • Neutrophils • Eosinophils • Basophils • Monocytes • Lymphocytes • Normal differential count	Theoretical + Practical	Theory & Practical Exams
10-11	4	Study, Knowledge & Application (Practical)	Leukocyte Disorders • Leukocytosis • Leukopenia • Reactive changes • Leukemia classification (AML, ALL, CML, CLL)	Theoretical + Practical	Theory & Practical Exams
12-13	4	Study, Knowledge & Application (Practical)	Platelets and Hemostasis • Primary hemostasis • Secondary hemostasis (coagulation cascade) • Von Willebrand disease • Hemophilia A and B • Thrombocytopenia • DIC	Theoretical + Practical	Theory & Practical Exams
14-15	4	Study, Knowledge & Application (Practical)	Laboratory Tests in Hematology • CBC • Blood film morphology • Reticulocyte count • ESR • PT • APTT • INR	Theoretical + Practical	Theory & Practical Exams

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).



Course Description Form — Computer Applications 2

1. Course Name	Computer Applications 2 (تطبيقات الحاسوب 2 / Excel)
2. Course Code	ATU-13-MLT-318-C-ME
3. Semester / Year	Third Year 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	3 / 2
7. Course Coordinator	Asst. Lect. Ahmed Taklif Tali
Email	—

8. Course Objectives

- Familiarize the student with the fundamental scientific concepts of the subject, its theoretical and practical aspects.
- Increase the efficiency and effectiveness of laboratory data analysis.
- Achieve the goals of the Medical Laboratory Techniques Department.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration
- Cooperative learning – Problem solving – Simulation
- Brainstorming – Role-playing
- Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1–15	3	Study and Knowledge of program applications	Microsoft Excel – Comprehensive Course • Learning the concept of the program, its benefits, specifications, features, and methods of operation. • Learning about the main screen and its components, menus and effective tools. • The concept of the cell, types of basic data, and how to enter it. • How to format cells: colors,	Theoretical + Practical	Theory & Practical Exams



borders, fonts,
text alignment.
• Merging cells
and splitting data
across columns.
• Creating and
applying filters,
sorting data, and
formatting
conditional data.
• Using basic
functions: SUM,
AVERAGE,
MIN, MAX,
COUNT.
• Statistical
functions:
STDEV, VAR,
MEDIAN,
MODE.
• Logical
functions: IF,
AND, OR, NOT.
• Lookup
functions:
VLOOKUP,
HLOOKUP,
INDEX,
MATCH.
• Creating and
customizing
charts (bar, pie,
line, scatter).
• Printing
options, page
setup, headers
and footers.
• Lab data
management:
entering patient
data, calculating
results,
generating
reports.

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).



Course Description Form — Endocrinology

1. Course Name	Endocrinology (علم الغدد الصماء)
2. Course Code	ATU-13-MLT-324-C-ME
3. Semester / Year	Semester 2 / Third Year 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	1. On-Campus (Face-to-Face): Attendance at theoretical and practical lectures in classrooms and labs. 2. Asynchronous Online: Educational materials available at any time. 3. Laboratory Practical (Based-Practical/Laboratory): Attendance in biochemistry labs for experiments and practical training.
6. Credit Hours / Units	2 Theory + 4 Practical / 4 Units
7. Course Coordinator	Dr. Fahad Fahad
Email	fahad.fahad@atu.edu.iq

8. Course Objectives

Knowledge Objectives:

- Introduce students to basic concepts of endocrinology science.
- Familiarize the student with the internal secretions, their chemical nature, and the role of each gland in the human body.
- Identify all types of glands and secreted hormones.
- Know the laboratory tests related to endocrine hormones.
- Understand the importance of clinical chemistry investigations and their role in diagnosis.
- Interpret laboratory findings of hormonal investigations and relate them to relevant medical conditions involving the glands.

Practical and Technical Skill Objectives:

- Prepare chemical reagents and instruments needed for hormonal investigations.
- Train the student practically on using the instruments specific to hormonal investigations (e.g., MINI VIDAS equipment).
- Develop student skill in performing hormonal investigations accurately and safely.
- Enable students to follow lab safety and biosafety procedures inside the laboratory.
- Develop students' ability to record results and analyze them statistically.
- Strengthen students' ability to solve problems faced during experiments or clinical examinations.

9. Teaching and Learning Strategies

- Lectures and discussions • Practical lessons using laboratory equipment
- Outcome-based learning • Project-based learning
- Group work-based learning • Problem-based learning
- Community-based learning • Self-directed learning

10. Course Structure — Semester 2



Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	2 Th.+4 Pr.	1. Introduce endocrinology, quality control in lab, hormone types. 2. Apply lab safety correctly. 3. Act professionally and as a team when handling specimens.	Introduction to Endocrinology • Glands of the body • Types of hormones • Hormone regulation • Lab quality control and safety	Interactive lectures + Practical • Clinical case discussions • Use of simulation programs	Theory: multiple choice, essay, case studies. Practical: lab performance, reports, short quizzes.
2-3	2 Th.+4 Pr.	1. Know types of hormone action mechanisms. 2. Understand biochemical pathways of each hormone type. 3. Know stimulators and inhibitors of each hormone type.	Mechanisms of Hormone Action • Membrane, cytoplasmic, and nuclear receptors • Second messenger systems (cAMP, DAG, IP3)	Interactive lectures • Clinical case discussions • Simulations	Theory & Practical Exams Lab Reports • Periodic Reviews
4-6	2 Th.+4 Pr.	Know all pituitary gland hormones and their medical significance	Pituitary Gland • Anterior pituitary: GH, TSH, LH, FSH, ACTH, Prolactin • Posterior pituitary: ADH (Vasopressin), Oxytocin • Clinical disorders and laboratory investigations	Interactive lectures • Practical lab sessions • Clinical case discussions	Theory & Practical Exams • Lab Reports
7-9	2 Th.+4 Pr.	Know thyroid hormones and their relationship to diseases	Thyroid Gland • T3, T4, rT3, TSH • Synthesis, regulation and secretion • Hypothyroidism • Hyperthyroidism • Thyroid function tests (TFT)	Interactive lectures • Practical lab sessions	Theory & Practical Exams
10-12	2 Th.+4 Pr.	Know adrenal hormones and their metabolic effects	Adrenal Gland • Cortex: glucocorticoids, mineralocorticoids, androgens • Medulla: catecholamines • Cushing's syndrome • Addison's disease	Interactive lectures • Practical lab sessions	Theory & Practical Exams
13-15	2 Th.+4 Pr.	Understand sex hormones and reproductive endocrinology	Gonadal Hormones • Male: Testosterone • Female: Estrogen, Progesterone • FSH, LH, hCG • Menstrual cycle	Interactive lectures • Practical lab sessions • Clinical case discussions	Theory & Practical Exams • Lab Reports Final Review

hormones
• Infertility
hormone profile •
Polycystic ovary
syndrome (PCOS)

11. Course Evaluation

100 marks: 40% Continuous Assessment (theory + practical monthly) + 60% Final Exam (theory + practical).





Course Description Form — Human Genetics

1. Course Name	Human Genetics (الوراثة البشرية)
2. Course Code	ATU-13-MLT-315-C-ME
3. Semester / Year	Third Year 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	—
7. Course Coordinator	—
Email	—

8. Course Objectives

- Provide students with general information and a basic understanding of the subject of genetics.
- Introduce students to the concept of safe biological science practice in the laboratory.
- Familiarize students with all laws of heredity and the most important genetic diseases.
- Develop the ability to perform karyotyping and analyze chromosomes.
- Understand genetic counseling principles and their application.

9. Teaching and Learning Strategies

- 1. Illustrative video presentations for the lecture.
- 2. Lecture delivery via PowerPoint slides.
- Practical: viewing observation slides and preparing for lectures.
- Oral and quiz-based discussions.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	2	Know general information about genetics	Introduction to Human Genetics • Basic concepts • Safe biological science in the laboratory	Explanatory video + Lecture via PowerPoint	Oral exams & quizzes
2	2	Know types of cell divisions	Cell Divisions • Mitosis • Meiosis • How to differentiate between them	Video + Lecture via PowerPoint	Oral exams & quizzes
3	2	Know stages of each division type	Stages of Cell Division • Stages of mitosis and meiosis • How to differentiate between the two types	Video + Lecture via PowerPoint	Oral exams & quizzes
4	2	Know human chromosomes	Human Chromosomes	Video + Lecture via PowerPoint	Scientific seminars



		and karyotyping	• Structure • • Karyotyping • • Reading the karyotype		Participation Lecture preparation
5	2	Know types of chromosomes and their classification	- Chromosome Types and Classification • Karyotyping • - Viewing of chromosomes in the practical session • - Identification of satellites	Video + Lecture via PowerPoint	Oral exams & quizzes
6-7	2	Know Mendelian laws of inheritance	- Mendelian Laws of Inheritance • Law of segregation • • Law of independent assortment • Monohybrid and dihybrid crosses	Video + Lecture via PowerPoint	Oral exams & quizzes
8-9	2	Know non-Mendelian inheritance patterns	- Non-Mendelian Inheritance • Codominance • • Incomplete dominance • • Epistasis • Multiple alleles • ABO blood group genetics	Video + Lecture via PowerPoint	Oral exams & quizzes
10-11	2	Know sex-linked inheritance	- Sex-Linked Inheritance • X-linked recessive (Hemophilia, Color blindness) • X-linked dominant • • Y-linked	Video + Lecture via PowerPoint	Oral exams & quizzes
12-13	2	Know sex-influenced and sex-limited traits	Sex-Influenced Traits and Sex-Determining Genes	Video + Lecture via PowerPoint	Oral exams & quizzes
14-18	2	Know chromosomal diseases and cancer genetics	- Chromosomal Abnormalities • Numerical (Down's syndrome, Turner, Klinefelter) • Structural (deletion, translocation, inversion) • Cancer chromosomes • - Gene-chromosome relationships in cancer	Video + Lecture via PowerPoint	Oral exams & quizzes
19-24	2	Know genetic diseases and their causes	- Genetic Diseases • Autosomal dominant • • Autosomal recessive	Video + Lecture via PowerPoint	Oral exams & quizzes

25-30	2	Know genetic counseling principles	• Multifactorial disorders • Pedigree analysis - Genetic Counseling • Indications • Process • Role in prevention of genetic diseases • Prenatal diagnosis methods	Video + Lecture via PowerPoint	Oral exams & quizzes
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11. Course Evaluation

Infrastructure / Resources: Whiteboard, PowerPoint, data show.

Assessment: Oral exams | Quizzes | Participation in scientific seminars and lecture preparation.



FOURTH YEAR — COURSE DESCRIPTIONS

Department of Medical Laboratory Techniques | 2025–2026



Course Description Form — Blood Transfusion

1. Course Name	Blood Transfusion
2. Course Code	ATU-13-MLT-415-C-M
3. Semester / Year	2025 / 2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	2 Theory + 3 Practical / —
7. Course Coordinator	—
Email	—

8. Course Objectives

- Introduce students to the concepts of blood banking and immunohematology.
- Develop skills in blood group typing (ABO, Rh) and compatibility testing.
- Familiarize students with blood component therapy and transfusion reactions.
- Train students in pre-transfusion testing: type and screen, crossmatch procedures.

9. Teaching and Learning Strategies

- Lectures and practical lessons | Outcome-based learning | Project-based learning | Group work | Problem-based learning | Community-based learning | Self-directed learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	2T+3P	Describe blood banking principles	Introduction to Blood Transfusion • History • Blood banking organization • ABO system	Lectures + Practical	Theory & Practical Exams
2	2T+3P	Identify major blood group systems	Blood Group Systems • Rh system (D, C/c, E/e) • Kell • Duffy • Kidd • Lewis • MNS • P systems	Lectures + Practical	Theory & Practical Exams
3	2T+3P	Perform safe lab and skilled lab safety work	Safe Laboratory Work • Biohazard precautions •	Lectures + Practical	Theory & Practical Exams



4-5	2T+3P	Perform serological testing	Handling blood specimens safely Pre-Transfusion Testing • Type and screen • Crossmatch (major and minor) • Antibody identification • Elution techniques	Lectures + Practical	Theory & Practical Exams
6-7	2T+3P	Identify blood components	Blood Components • Whole blood • Packed RBCs • Platelets • FFP • Cryoprecipitate • Granulocytes • Albumin	Lectures + Practical	Theory & Practical Exams
8-9	2T+3P	Recognize transfusion reactions	Transfusion Reactions • Hemolytic (immediate and delayed) • Febrile non-hemolytic • Allergic • TRALI • Transfusion-transmitted infections	Lectures + Practical	Theory & Practical Exams
10-11	2T+3P	Understand special transfusion situations	Special Transfusion Situations • Neonatal and pediatric transfusions • Massive transfusion • Autologous donation • Irradiated blood	Lectures + Practical	Theory & Practical Exams
12-13	2T+3P	Know HTLA antibodies	Hemolytic Disease of the Newborn (HDN) • Maternal antibodies • Rh incompatibility • ABO HDN • Intrauterine transfusion	Lectures + Practical	Theory & Practical Exams
14-15	2T+3P	Understand quality control in blood banking	Quality Control and Regulatory Standards in Blood Banking • AABB standards • Record keeping • Look-back procedures	Lectures + Practical Brainstorming	Theory & Practical Exams

11. Course Evaluation

The grade is distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.



Course Description Form — Diagnostic Microbiology

1. Course Name	Diagnostic Microbiology
2. Course Code	ATU-I3-MLT-412-C-M
3. Semester / Year	2025 / 2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	2 Theory + 4 Practical / —
7. Course Coordinator	—
Email	—

8. Course Objectives

- Introduce students to clinical specimen collection, processing, and transport.
- Apply laboratory safety protocols in clinical microbiology.
- Train students to identify and select appropriate clinical samples for microbiological examination.
- Develop skills in isolation and identification of pathogenic microorganisms from clinical specimens.
- Prepare students to work in clinical microbiology laboratories.

9. Teaching and Learning Strategies

- Lectures and practical lessons | Outcome-based learning | Project-based learning | Group work | Problem-based learning | Community-based learning | Self-learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1	2T+4P	Perform safe lab work	Safe Laboratory and Skilled Laboratory Safety Work • Biosafety levels • PPE • Decontamination procedures	Lectures + Practical	Theory & Practical Exams
2	2T+4P	Identify and select clinical samples	Clinical Sample Collection and Processing • Types of specimens • Collection procedures • Transport conditions	Lectures + Practical	Theory & Practical Exams
3-4	2T+4P	Diagnose urinary tract infections	Diagnosis of Urinary Tract Infections (UTIs) • Urine microscopy • Urine culture • Colony count	Lectures + Practical	Theory & Practical Exams



5-6	2T+4P	Diagnose respiratory tract infections	interpretation Diagnosis of Respiratory Tract Infections • Sputum culture • Throat swab • Bronchoalveolar lavage • Strep throat testing • Legionella antigen	Lectures + Practical	Theory & Practical Exams
7-8	2T+4P	Diagnose blood stream infections	Bacteremia and Septicemia • Blood culture techniques • Interpretation • Common blood-borne pathogens	Lectures + Practical	Theory & Practical Exams
9-10	2T+4P	Diagnose wound infections	Wound and Skin Infections • Wound swab processing • Identification of wound pathogens • Burn wound cultures	Lectures + Practical	Theory & Practical Exams
11-12	2T+4P	Diagnose CSF infections	Central Nervous System Infections • CSF collection and processing • Meningitis pathogens • Encephalitis diagnosis	Lectures + Practical	Theory & Practical Exams
13-14	2T+4P	Diagnose GI tract infections	Diagnosis of Gastrointestinal Tract Infections • Stool culture • Enteric pathogens • H. pylori testing	Lectures + Practical	Theory & Practical Exams
15	2T+4P	Diagnose sexually transmitted infections	Sexually Transmitted Infections (STIs) • Gonorrhea (N. gonorrhoeae) • Syphilis (T. pallidum) • Chlamydia • Trichomonas Brainstorming	Lectures + Practical Brainstorming	Theory & Practical Exams

11. Course Evaluation

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

12. Learning and Teaching Resources

Required Textbooks	Standard clinical microbiology textbooks and references
Electronic Sources	—



Course Description Form — Pathology

1. Course Name	Pathology (Advanced)
2. Course Code	ATU-13-MLT-411-C-M
3. Semester / Year	2025 / 2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	1 Theory + 1 Practical / —
7. Course Coordinator	—
Email	—

8. Course Objectives

- Establishing a good information base on pathology and modern techniques to enable the student to keep up with the medical community after graduation.
- Develop skills in identifying pathological conditions through microscopic tissue examination.
- Understand pathological mechanisms of systemic diseases.

9. Teaching and Learning Strategies

- Lectures and practical lessons | Outcome-based learning | Project-based learning | Group work | Problem-based learning | Self-directed learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1-2	1T+1P	Understand advanced cell pathology	Advanced Cell Pathology • Acute and chronic cell injury mechanisms • Intracellular accumulations • Dystrophic calcification	Lectures + Practical	Theory & Practical Exams
3-4	1T+1P	Understand tumor biology	Neoplasia – Advanced Topics • Oncogenes and tumor suppressor genes • Apoptosis in cancer • Metastasis mechanisms • Angiogenesis in tumors	Lectures + Practical	Theory & Practical Exams
5-6	1T+1P	Know cardiovascular pathology	Cardiovascular Pathology • Ischemic heart disease • Heart failure • Pericarditis • Vascular tumors	Lectures + Practical	Theory & Practical Exams
7-8	1T+1P	Know respiratory pathology	Pulmonary Pathology	Lectures + Practical	Theory & Practical Exams



			• Pneumonia types • - Lung cancer (adenocarcinoma, squamous cell) • COPD • - Sarcoidosis • - Pulmonary embolism		
9	1T+1P	Know renal pathology	Renal Pathology • Glomerular diseases • Renal cell carcinoma • Wilm's tumor	Lectures + Practical	Theory & Practical Exams
10-11	1T+1P	Know GI pathology	Gastrointestinal Pathology • Gastric cancer • Colorectal carcinoma • Inflammatory bowel disease	Lectures + Practical	Theory & Practical Exams
12	1T+1P	Know liver pathology	Hepatic Pathology • Cirrhosis • Hepatocellular carcinoma • Cholangiocarcinoma	Lectures + Practical	Theory & Practical Exams
13	1T+1P	Know endocrine pathology	Endocrine Pathology • Thyroid tumors • Parathyroid disorders • Adrenal tumors	Lectures + Practical	Theory & Practical Exams
14-15	1T+1P	Know lymphoma/leukemia pathology	Lymphoma and Leukemia • Hodgkin vs. Non-Hodgkin lymphoma • Acute vs. chronic leukemia • Multiple myeloma	Lectures + Practical	Theory & Practical Exams

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student.



Course Description Form — Clinical Immunology

1. Course Name	Clinical Immunology
2. Course Code	ATU-13-MLT-416-C-M
3. Semester / Year	2025 / 2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	2 Theory + 4 Practical / —
7. Course Coordinator	—
Email	—

8. Course Objectives

- Introducing and understanding students in clinical immunology, its scientific divisions, and the most important common and rare immunological diseases.
- Understanding the pathological mechanism of disease.
- Developing skills in immunological laboratory tests used in diagnosis.

9. Teaching and Learning Strategies

- Lectures and practical lessons | Outcome-based learning | Project-based learning | Group work | Problem-based learning | Community-based learning | Self-learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1-2	2T+4P	The student learns about the immune mechanism of disease, symptoms, and diagnosis	Introduction to Clinical Immunology • Immunological diseases classification • Innate vs. adaptive immunity in disease context	2 Theory + 4 Practice Lectures + Practical	Theory & Practical Exams
3-4	2T+4P	The student learns about the immune mechanism of disease, symptoms, and diagnosis	Hypersensitivity Disorders • Anaphylaxis • Allergic asthma • Atopic dermatitis • Autoimmune hemolytic anemia • Serum sickness • SLE • Contact dermatitis	2 Theory + 4 Practice	Theory & Practical Exams
5-6	2T+4P	The student learns about the immune mechanism of disease, symptoms, and diagnosis	Autoimmune Diseases – Advanced • Rheumatoid arthritis • Sjögren's syndrome • Myasthenia gravis • ANA panel • ANCA • Anti-dsDNA	2 Theory + 4 Practice	Theory & Practical Exams
7-8	2T+4P	The student	Primary	2 Theory + 4	Theory &



		learns about the immune mechanism of disease, symptoms, and diagnosis	Immunodeficiencies • Agammaglobulinemia • DiGeorge syndrome • SCID • Chronic granulomatous disease • Complement deficiencies	Practice	Practical Exams
9-10	2T+4P	The student learns about the immune mechanism of disease, symptoms, and diagnosis	Secondary Immunodeficiencies • HIV/AIDS immunopathology • CD4 count monitoring • Viral load testing • Opportunistic infections	2 Theory + 4 Practice	Theory & Practical Exams
11-12	2T+4P	The student learns about the immune mechanism of disease	Transplantation Immunology • Rejection mechanisms (hyperacute, acute, chronic) • HLA typing • Immunosuppressive therapy • Organ matching	2 Theory + 4 Practice	Theory & Practical Exams
13-14	2T+4P	The student learns about the immune mechanism of disease	Immunological Laboratory Techniques • ELISA • Western blot • Flow cytometry • Immunofluorescence • Agglutination tests • Complement fixation	2 Theory + 4 Practice Asking questions and discussion • Learning methods	Theory & Practical Exams
21-22	2T+4P	The student learns about the immune mechanism	Tumor Immunology and Immunotherapy • Tumor antigens • Immune evasion • Monoclonal antibodies • CAR-T cell therapy • Checkpoint inhibitors	2 Theory + 4 Practice	Theory & Practical Exams

11. Course Evaluation

Distributing the score out of 100: First semester = 10 Theoretical + 10 Practical = 20 | Final exam = 60.



Course Description Form — Medical Parasitology 2

1. Course Name	Medical Parasitology 2
2. Course Code	ATU-13-MLT-413-C-M
3. Semester / Year	2025 / 2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	2 Theory + 4 Practical / —
7. Course Coordinator	—
Email	—

8. Course Objectives

- This course aims to introduce students to the basic concepts of medical parasitology – whether parasitic worms or protozoa – and to identify all diseases transmitted by parasites and their methods of transmission, as well as their diagnosis.
- Students learn the different laboratory diagnostic mechanisms and their degree of accuracy.
- Develop practical skills in the preparation and examination of parasitological specimens.

9. Teaching and Learning Strategies

- Lectures and practical lessons | Outcome-based learning | Project-based learning | Group work | Problem-based learning | Community-based learning | Self-learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1–2	2T+4P	The student understands protozoa: general features, structure, reproduction, life cycle, pathogenicity, clinical features, laboratory diagnosis, and treatment.	Protozoa – General Features • Structure • Reproduction • Life cycle • Pathogenicity and clinical features • Lab diagnosis • Treatment	Lectures + Practical Theory & oral exams Brainstorming	Theory & Practical Exams
3	2T+4P	Understanding Acanthamoeba and its significance	Acanthamoeba Species • Distribution • Morphology • Life Cycle • Pathogenesis and clinical features • Lab diagnosis	Lectures + Practical Brainstorming	Theory & Practical Exams
4–6	2T+4P	The student understands blood and tissue protozoa	Plasmodium (Malaria) • Species (P. falciparum,	Lectures + Practical Brainstorming	Theory & Practical Exams



			vivax, malariae, ovale) • Life cycle • - Blood film examination • - RDT tests - Toxoplasma gondii – congenital toxoplasmosis - Leishmania spp. – cutaneous and visceral forms		
7-9	2T+4P	The student understands intestinal nematodes	Intestinal Nematodes – Advanced • Necator americanus and Ancylostoma duodenale (hookworms) • Strongyloides stercoralis • - Filarial worms	Lectures + Practical Brainstorming	Theory & Practical Exams
10-11	2T+4P	The student understands trematodes	Trematodes (Flukes) • Schistosoma species (mansoni, haematobium, japonicum) • Fasciolopsis buski • Liver flukes: Fasciola hepatica • Lung fluke: Paragonimus	Lectures + Practical Brainstorming	Theory & Practical Exams
11	2T+4P	Understand tapeworm diagnosis and treatment	Cestodes – Advanced • Echinococcus granulosus (hydatid cyst) • Diagnosis: serology, imaging, histology • Taenia saginata vs. T. solium differentiation	Lectures + Practical	Theory & Practical Exams
12-13	2T+4P	Know advanced lab diagnostic methods	Advanced Parasitological Diagnostic Techniques • Concentration methods: formol-ether, zinc sulfate flotation • Serological tests: ELISA, IFA • Molecular diagnosis: PCR	Lectures + Practical Brainstorming	Theory & Practical Exams
14-15	2T+4P	Know medically important arthropods	Medical Entomology – Advanced • Mosquito-borne diseases vector control • Ticks and tick-borne diseases	Lectures + Practical Brainstorming	Theory & Practical Exams

- Mites: scabies, demodicosis •
- Lice: pediculosis, typhus

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student, including: 10 Attendance & Participation, 10 Classroom Activities, 20 Monthly Exam, 60 Final Exam (Theoretical + Practical).

12. Learning and Teaching Resources

Required Textbooks	Standard medical parasitology textbooks
Electronic Sources	—





Course Description Form — Clinical Chemistry

1. Course Name	Clinical Chemistry (Advanced)
2. Course Code	ATU-13-MLT-414-C-M
3. Semester / Year	2025 / 2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	2 Theory + 4 Practical / —
7. Course Coordinator	—
Email	—

8. Course Objectives

- Introducing students to the basic principles related to pathological analyses in clinical chemistry.
- Introducing students to the theoretical knowledge needed for accurate interpretation of clinical chemistry tests.
- Develop advanced laboratory skills in clinical chemistry instrumentation and quality management.

9. Teaching and Learning Strategies

- Lectures and practical lessons | Outcome-based learning | Project-based learning | Group work | Problem-based learning | Community-based learning | Self-directed learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
1-2	2T+4P	Understand quality management in clinical chemistry	Quality Management in Clinical Chemistry • Fundamentals of quality management • Accuracy, precision, sensitivity, specificity • Reference ranges	Lectures + Practical 2T + 4P	Theory & Practical Exams
3-4	2T+4P	Understand advanced carbohydrate analysis	Carbohydrate Metabolism – Advanced • Glycolysis • Gluconeogenesis • Glycogen storage diseases • HbA1c methodology • Insulin assay	Lectures + Practical	Theory & Practical Exams
5-6	2T+4P	Understand advanced lipid analysis	Lipid Metabolism – Advanced • Lipoprotein electrophoresis	Lectures + Practical	Theory & Practical Exams



7-8	2T+4P	Perform protein and enzyme analysis	Apolipoprotein analysis - Dyslipidemia assessment - Cardiovascular risk markers Proteins and Enzymes in Clinical Chemistry - Serum protein electrophoresis - Specific proteins (CRP, ferritin) - Enzyme kinetics - Isoenzymes in cardiac disease	Lectures + Practical	Theory & Practical Exams
8-10	2T+4P	Understand renal and electrolyte analysis	Quality Management – Particular Emphasis - Electrolytes: Na⁺, K⁺, Cl⁻, Ca²⁺, Mg²⁺, phosphate - Acid-base disorders: metabolic and respiratory - Renal function panel interpretation	Lectures + Practical 2T + 4P	Theory & Practical Exams
11-13	2T+4P	Perform hormonal and tumor marker analysis	Tumor Markers - AFP, CEA, PSA, CA-125, CA 19-9, Beta-hCG - Clinical significance and interpretation	Lectures + Practical	Theory & Practical Exams
14-15	2T+4P	Understand point-of-care testing	Automation and Point-of-Care Testing - Automated analyzers (principle and maintenance) - POCT devices - Delta checks - Critical values	Lectures + Practical	Theory & Practical Exams
19-21	2T+4P	Perform specialized tests	Therapeutic Drug Monitoring - Pharmacokinetics basics - Common drug levels (digoxin, theophylline, phenytoin, lithium)	Lectures + Practical	Theory & Practical Exams

11. Course Evaluation

The grade is distributed out of 100 based on tasks assigned to the student.

12. Learning and Teaching Resources

Required Textbooks	Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 6th Ed. Burtis & Ashwood: Tietz Fundamentals of Clinical Chemistry
Electronic Sources	—





Course Description Form — Professional Ethics in Medical Laboratories

1. Course Name	Professional Ethics in Medical Laboratories
2. Course Code	ATU-13-MLT-417-C-M
3. Semester / Year	2025 / 2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	1 Hour per Week / —
7. Course Coordinator	Asst. Lect. Enas Kazim Abdul Amir
Email	enas.kazim.chm@atu.edu.iq

8. Course Objectives

First: Cognitive Objectives:

- Understanding control practices of professional behavior.
- Discrimination between healthy professional behavior and other types of behavior.
- Perception of the relationship between values of character and professional values.
- Recognition of laws and systems associated with professional ethics.
- To understand the role of ethics in strengthening trust and credibility in institutions.
- Comprehension of the commitment to or breach of professional ethics on individual and society.
- Recognition of standards of integrity, transparency, justice, and professional responsibility.

Second: Skill-Based Objectives:

- Take decisions based on professional ethical standards.
- Solve problems professionally with fairness and integrity.
- Communicate transparently and respectfully.
- Administer conflicts in a balanced manner.
- Analyze ethical positions and choose the most suitable response.
- Adjust oneself under work-related pressures.
- Work in team spirit with respect and responsibility.

9. Teaching and Learning Strategies

- Lectures (Pain Presents) – Oral presentations
- Outcome-based learning | Project-based learning
- Learning based on teamwork | Problem-based learning
- Community-based learning | Self-directed learning

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit/Topic Name	Teaching Method	Evaluation Method
First Week	1	Student's understanding of the topic	Principles of Professional Ethics	Lectures Discussion Brainstorming	Daily Exams Reports Editorial Exams



			• In the stages of civilizational development • Principles of professional ethics in Arab and Islamic civilization		Discussions
Second Week	1	Student's understanding of the topic	Legal Rights and Responsibilities • Rights of the laboratory professional • Responsibilities toward patients, institutions, and colleagues	Lectures Discussion Brainstorming	Daily Exams Reports Discussions
Third–Fourth Week	1	Student's understanding of the topic	Professional Ethics Standards • Integrity • Transparency • Justice • Accountability	Lectures Brainstorming Discussion	Daily Exams Editorial Exams Discussions
Fifth–Sixth Week	1	Student's understanding of the topic	Code of Conduct for Medical Laboratory Professionals • Confidentiality • Privacy • Informed consent • Patient rights and ethical obligations	Lectures Discussion Brainstorming	Daily Exams Reports Discussions
Seventh–Eighth Week	1	Student's understanding of the topic	Ethics in Research and Scientific Publications • Research integrity • Data fabrication and plagiarism • Authorship and acknowledgment ethics	Lectures Brainstorming Discussion	Daily Exams Editorial Exams Discussions
Ninth–Tenth Week	1	Student's understanding of the topic	Dealing with Patients and Maintaining Professional Secrets • Communication skills • Gaining patient trust • Maintaining professional confidentiality	Lectures Discussion Brainstorming	Daily Exams Reports Discussions
Eleventh–Twelfth Week	1	Student's understanding of the topic	Ethical Decision-Making Under Pressure • Conflict of interest • Whistle-blowing • Ethical dilemmas in the laboratory	Lectures Brainstorming Discussion	Daily Exams Editorial Exams Discussions
Thirteenth–Fourteenth Week	1	Student's understanding of the topic	Definition of Personality and Professional Development	Discussion Brainstorming Reports Editorial	Daily Exams Reports Discussions

		• Self-assessment • Building professional identity • Continuous professional development (CPD)	Definition of personality	
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11. Course Evaluation

The grade is distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Resources

Main References (Sources)	Occupational Safety (standard texts)
Recommended Books and References	—
Electronic References and Websites	YouTube

13. Course Development Plan

- Update scientific content.
- Teaching methods through lectures, workshops, and laboratory simulations.
- Continuous improvement.
- Sources and references.
- Evaluation strategy.

Practical and Applied Training:

- Commitment and discipline.
- Honesty and integrity.
- Confidentiality and preservation of information.
- Justice and neutrality.
- Respect and professional communication.





Course Description Form — Laboratory Management

1. Course Name	Laboratory Management
2. Course Code	ATU-13-MLT-418-C-M
3. Semester / Year	2025 / 2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	1 Hour per Week / —
7. Course Coordinator	Asst. Lect. Enas Kazim Abdul Amir
Email	enas.kazim.chm@atu.edu.iq

8. Course Objectives

First: Cognitive Objectives:

- Demonstrate leadership skills in medical laboratory management.
- Introduce students to the special methods for managing laboratories properly.
- Introduce students to the types of laboratories and the duties of the laboratory manager.
- Learn about modern methods of laboratory management.
- Understand the importance of scientific research ethics and its impact on the quality and reliability of results.

Second: Skill-Based Objectives:

- The student organizes laboratory tools and equipment in a way that facilitates access and use.
- The student shall prepare laboratory records and inventories accurately and professionally.
- The student must apply occupational safety procedures inside the laboratory.
- The student shall calibrate laboratory equipment according to standard instructions.
- The student should handle chemicals and waste in a correct and safe manner.
- The student plans the laboratory schedule and tasks efficiently.
- The student should conduct a periodic inventory of laboratory supplies and track inventory.
- The student shall prepare periodic laboratory performance reports.

9. Teaching and Learning Strategies

- Lectures (Presentations) – Oral presentations
- Outcome-based learning | Project-based learning
- Learning based on teamwork | Problem-based learning
- Community-based learning | Self-directed learning

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation Method
First Week	1	Student's understanding of the topic	Laboratory Buildings: General Design	Lectures Discussion Brainstorming	Daily Exams Reports Editorial Exams



			• Laboratory classification and types • Objectives of laboratory design		Discussions
Second Week	1	Student's understanding of the topic	- Occupational Safety in Laboratories • Types of hazards • Biological, chemical, physical, fire hazards • PPE selection and use • Accident reporting	Lectures Discussion Brainstorming	Daily Exams Reports Discussions
Third–Fourth Week	1	Student's understanding of the topic	- Laboratory Equipment Management • Calibration • Preventive maintenance • Equipment records • Instrument troubleshooting	Lectures Discussion Brainstorming	Daily Exams Editorial Exams Discussions
Fifth–Sixth Week	1	Student's understanding of the topic	- Quality Management Systems in Laboratories • ISO 15189 requirements • Total quality management • Internal audits • Proficiency testing	Lectures Discussion Brainstorming	Daily Exams Reports Discussions
Seventh–Eighth Week	1	Student's understanding of the topic	- Human Resources Management in Laboratories • Job descriptions • Training and competency assessment • Scheduling and workload management	Lectures Brainstorming Discussion	Daily Exams Editorial Exams Discussions
Ninth Week	1	Student's understanding of the topic	- Inventory and Supply Chain Management • Reagent ordering and storage • Stock rotation (FIFO) • Expired material management • Budget planning	Lectures Discussion Brainstorming	Daily Exams Reports Discussions
Tenth–Twelfth Week	1	Student's understanding of the topic	- Laboratory Information Systems (LIS) • Electronic records • Barcode systems • Patient data	Lectures Brainstorming Discussion	Daily Exams Editorial Exams Discussions

Thirteenth– Fifteenth Week	1	Student's understanding of the topic	management • Integration with hospital information systems (HIS) Performance Indicators and Reporting • Key performance indicators (KPIs) • Turnaround time (TAT) • Error rates • Customer satisfaction • Preparing periodic laboratory performance reports	Discussion Brainstorming Reports	Daily Exams Reports Discussions
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11. Course Evaluation

The grade is distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Resources

Main References (Sources)	Occupational Safety (standard texts)
Recommended Books and References	—
Electronic References and Websites	YouTube

13. Course Development Plan

- Update scientific content.
- Teaching methods through lectures, workshops, and laboratory simulations.
- Continuous improvement.
- Sources and references.
- Evaluation strategy.

Practical and Applied Training:

- Commitment and discipline.
- Honesty and integrity.
- Confidentiality and preservation of information.
- Justice and neutrality.
- Respect and professional communication.





FIRST YEAR — ADDITIONAL COURSES (ADDENDUM)

Department of Medical Laboratory Techniques | 2025–2026

Course Description Form — General Biology 1

1. Course Name	General Biology 1
2. Course Code	ATU-13-MLT-113-C-ME
3. Semester / Year	First Semester / First Year
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	7 Study Hours / 4 Units
7. Course Coordinator	Asst. Lect. Ahmed Rahe Abd
Email	—

8. Course Objectives

At the end of the academic year, the student will be able to understand the functions of the various cells and systems of the body in general, and perform various techniques for analyzing blood and other body fluids.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration – Cooperative learning
- Problem solving – Simulation – Brainstorming – Role-playing – Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation
1	7	Study, Knowledge & Application	The Science of Biology • Why study biology and its importance • Definition of biology • Subdivisions of biology	Theoretical + Practical	Written & Practical Exams
2	7	Study, Knowledge & Application	The Characteristics of Living Things (Organisms) • Evaluation, Adaptation, Respiration, Homeostasis • Metabolism: Anabolism, Catabolism • Response to	Theoretical + Practical	Written & Practical Exams



3	7	Study, Knowledge & Application	stimuli, Reproduction The Kingdom of Living Things • Classification of Organisms • Categories of Classification • The Five-Kingdom Scheme of Classification	Theoretical + Practical	Written & Practical Exams
4	7	Study, Knowledge & Application	Chemistry of Life (Biology of Polymers) • Levels of Organization • Lipids • Carbohydrates • Proteins • Amino Acids	Theoretical + Practical	Written & Practical Exams
5	7	Study, Knowledge & Application	Cell Structure and Function – Animal Cells • Cell Wall • Cell Membrane • Cytoplasmic Matrix • Nucleolus • Endoplasmic Reticulum • Golgi Apparatus • Cilia • Flagella	Theoretical + Practical	Written & Practical Exams
6	7	Study, Knowledge & Application	Plant Cells • Comparison Between Animal and Plant Cells	Theoretical + Practical	Written & Practical Exams
7	7	Study, Knowledge & Application	Prokaryotes vs Eukaryotes • Differences, Characteristics, and Comparison	Theoretical + Practical	Written & Practical Exams
8	7	Study, Knowledge & Application	Cell Life Cycle – Mitosis • Nucleus Division • Cytoplasmic Division	Theoretical + Practical	Written & Practical Exams
9	7	Study, Knowledge & Application	Meiosis (Human Reproduction) • Spermatogenesis	Theoretical + Practical	Written & Practical Exams
10	7	Study, Knowledge & Application	Oogenesis Gene and Gene Action • DNA • RNA • Genetic Codes	Theoretical + Practical	Written & Practical Exams
11	7	Study, Knowledge & Application	Replication, Translation, Transcription, Mutation	Theoretical + Practical	Written & Practical Exams
12	7	Study, Knowledge & Application	Organ Systems • Digestive • Circulatory • Respiratory • Urinary • Muscular • Nervous	Theoretical + Practical	Written & Practical Exams
13	7	Study,	Viruses, Viroids,	Theoretical +	Written &

		Knowledge & Application	Prions, Bacteriophages • Virtual Life Cycle • Characteristics • Shapes	Practical	Practical Exams
14	7	Study, Knowledge & Application	Viral Human Diseases • Harmful effects of viruses	Theoretical + Practical	Written & Practical Exams
15	7	Study, Knowledge & Application	Kingdom of Monera – Phylum Schizophyte (Bacteria) • Classification • Structure • Morphology • Growth and Function • Motility	Theoretical + Practical	Written & Practical Exams

11. Course Evaluation

100 marks: Attendance 10 | Classroom Activities 10 | Monthly Exam 20 | Final Exam 60.

12. Learning and Teaching Resources

Required Textbooks	Biology 25: Human Biology – Prof. Gonsalves, Los Angeles City College (Loosely Based on Mader's Human Biology)
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Course Description Form — General Biology 2

1. Course Name	General Biology 2
2. Course Code	ATU-13-MLT-121-C-ME
3. Semester / Year	Second Semester / First Year
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	7 Study Hours / 4 Units
7. Course Coordinator	Asst. Lect. Ahmed Rahe Abd
Email	—

8. Course Objectives

At the end of the academic year, the student will be able to understand the functions of the various cells and systems of the body in general, and perform various techniques for analyzing blood and other body fluids.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration – Cooperative learning
- Problem solving – Simulation – Brainstorming – Role-playing – Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation
1	7	Study, Knowledge & Application	Harmful Activity of Bacteria • Bacterial Diseases in Human and Animals • Control of Bacteria	Theoretical + Practical	Written & Practical Exams
2	7	Study, Knowledge & Application	Kingdom of Protista – Simple Algae • Harmful effects of Algae	Theoretical + Practical	Written & Practical Exams
3	7	Study, Knowledge & Application	Kingdom of Protista – Protozoans • Classification of Protozoa	Theoretical + Practical	Written & Practical Exams
4	7	Study, Knowledge & Application	Phylum of Sarcodina – Amoebas • Phylum of Zoomastigina • Trypanosoma • Giardia	Theoretical + Practical	Written & Practical Exams
5	7	Study, Knowledge & Application	Phylum of Sporozoa – Plasmodium • Life cycle •	Theoretical + Practical	Written & Practical Exams



6	7	Study, Knowledge & Application	Pathogenesis • Diagnosis Kingdom of Fungi • Classification • Reproduction • Importance in Medicine	Theoretical + Practical	Written & Practical Exams
7	7	Study, Knowledge & Application	Harmful Activities of Fungi • Mycotoxins • Opportunistic infections	Theoretical + Practical	Written & Practical Exams
8	7	Study, Knowledge & Application	Yeast and Yeast-Like Fungi • Characteristics and Classification • Candida species	Theoretical + Practical	Written & Practical Exams
9	7	Study, Knowledge & Application	Kingdom of Animals • Classification • Invertebrates and Vertebrates • Importance to Human Diseases	Theoretical + Practical	Written & Practical Exams
10	7	Study, Knowledge & Application	Human Body • Protection, Support and Locomotion	Theoretical + Practical	Written & Practical Exams
11	7	Study, Knowledge & Application	Human Body Defense • Immunity • Antigen • Antibody • Hormones •	Theoretical + Practical	Written & Practical Exams
12	7	Study, Knowledge & Application	Enzymes Helminths • Characteristics and Classification • Flat Worms • Round Worms	Theoretical + Practical	Written & Practical Exams
13	7	Study, Knowledge & Application	Worm Classification • Harmful Activities to Human	Theoretical + Practical	Written & Practical Exams
14	7	Study, Knowledge & Application	Ecosystem and Relationships between Organisms • Symbiosis • Parasitism • Commensalism • Mutualism	Theoretical + Practical	Written & Practical Exams
15	7	Study, Knowledge & Application	Scientific Methods • Steps and Examples of Scientific Methods in Biology	Theoretical + Practical	Written & Practical Exams

11. Course Evaluation

Distributed out of 100: Attendance 10 | Classroom Activities 10 | Monthly Exam 20 | Final Exam 60 (Theory + Practical).

12. Learning and Teaching Resources

Required Textbooks

Biology 25: Human Biology – Prof. Gonsalves, Los Angeles City College (Loosely Based on Mader's Human Biology)





Course Description Form — Human Rights and Democracy

1. Course Name	Human Rights and Democracy
2. Course Code	ATU-13-MLT-117-C-ME
3. Semester / Year	First Semester / First Year 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person
6. Credit Hours / Units	2 Units / 30 Hours
7. Course Coordinator	Asst. Lect. Dr. Wasim Jabir Ibrahim
Email	—

8. Course Objectives

- Understand the historical stages of human rights through religious and legal legislation.
- Comprehend the concept of personal and public freedoms according to religions, constitutions, and laws.
- Understand the concepts of equality based on sex, belief, and race.
- Assimilate the concepts of democracy.

9. Teaching and Learning Strategies

- Theoretical and practical methods
- Lectures with visual presentations and illustrative videos
- Tangible models and open discussion

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation
1	2	Understanding the lecture	Human Rights – Definition, Historical Development • Human rights in ancient civilizations • Human rights in the Euphrates River Valley • Human rights in Heavenly Laws with focus on Islam	Lecture delivery • Q&A	Written & oral exams
2	2	Understanding the lecture	Human Rights in Modern History • International recognition since World War I • United Nations Universal Declaration • Regional Agreements:	Lecture delivery • Q&A	Written & oral exams



			European, American, African (1969), Arab (1981, 1994) • Role of International NGOs (Red Cross, Amnesty International, Human Rights Watch)		
3	2	Understanding the lecture	Human Rights in Arab and Iraqi Constitutions • Relationship between theory and reality • Human rights in regional constitutions Economic, Social, and Cultural Rights • Civil and political rights • Modern facts: right to development, clean environment, solidarity Guarantees for Protection of Human Rights at the National Level • Constitutional guarantees • Rule of law principle • Constitutional oversight • Freedom of press and public opinion • Role of NGOs Guarantees at the International Level • Role of the United Nations and specialized agencies • Role of regional organizations (Arab League, EU, African Union) • Role of NGOs in protecting human rights	Lecture delivery • Q&A	Written & oral exams
4	2	Understanding the lecture	Human Rights in Arab and Iraqi Constitutions • Relationship between theory and reality • Human rights in regional constitutions Economic, Social, and Cultural Rights • Civil and political rights • Modern facts: right to development, clean environment, solidarity Guarantees for Protection of Human Rights at the National Level • Constitutional guarantees • Rule of law principle • Constitutional oversight • Freedom of press and public opinion • Role of NGOs Guarantees at the International Level • Role of the United Nations and specialized agencies • Role of regional organizations (Arab League, EU, African Union) • Role of NGOs in protecting human rights	Lecture delivery • Q&A	Written & oral exams
5	2	Understanding the lecture	Human Rights in Arab and Iraqi Constitutions • Relationship between theory and reality • Human rights in regional constitutions Economic, Social, and Cultural Rights • Civil and political rights • Modern facts: right to development, clean environment, solidarity Guarantees for Protection of Human Rights at the National Level • Constitutional guarantees • Rule of law principle • Constitutional oversight • Freedom of press and public opinion • Role of NGOs Guarantees at the International Level • Role of the United Nations and specialized agencies • Role of regional organizations (Arab League, EU, African Union) • Role of NGOs in protecting human rights	Lecture delivery • Q&A	Written & oral exams
6	2	Understanding the lecture	Human Rights in Arab and Iraqi Constitutions • Relationship between theory and reality • Human rights in regional constitutions Economic, Social, and Cultural Rights • Civil and political rights • Modern facts: right to development, clean environment, solidarity Guarantees for Protection of Human Rights at the National Level • Constitutional guarantees • Rule of law principle • Constitutional oversight • Freedom of press and public opinion • Role of NGOs Guarantees at the International Level • Role of the United Nations and specialized agencies • Role of regional organizations (Arab League, EU, African Union) • Role of NGOs in protecting human rights	Lecture delivery • Q&A	Written & oral exams
7	2	Understanding the lecture	General Theory of Freedoms • Origin of rights and freedoms • Legitimate legal position	Lecture delivery • Q&A	Written & oral exams



8	2	Understanding the lecture	• The concept of the Rule of Law State - Organization of Public Freedoms by Public Authorities: - Equality • Historical development of the concept of equality • Modern idea of equality • Equality between sexes and individuals • Equality based on belief and race	Lecture delivery • Q&A	Written & oral exams
9	2	Understanding the lecture	Democracy – Definition, Types, and Concepts of Democracy • Concepts of democracy	Lecture delivery • Q&A	Written & oral exams
10	2	Understanding the lecture	Democracy in the Third World • Democratic systems in the world	Lecture delivery • Q&A	Written & oral exams
11	2	Understanding the lecture	Classification of Freedoms – General Freedoms • Basic freedoms • Intellectual freedoms • Economic and social freedoms	Lecture delivery • Q&A	Written & oral exams
12	2	Understanding the lecture	Freedom of Security and Safety • Freedom of Movement • Freedom of Education • Freedom of Press • Freedom of Assembly	Lecture delivery • Q&A	Written & oral exams
13	2	Understanding the lecture	Freedom of Associations • Freedom of Work • Right to Property	Lecture delivery • Q&A	Written & oral exams
14	2	Understanding the lecture	Freedom of Trade and Industry • Women's Freedom • Political Parties and Public Freedoms • Scientific and Technological Progress and Public Freedoms	Lecture delivery • Q&A	Written & oral exams
15	2	Understanding	The Future of	Lecture delivery	Written & oral

	the lecture	Public Freedoms • Review and discussion of all topics	• Q&A	exams
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11. Course Evaluation

100 marks: Attendance 10 | Classroom Activities 10 | Monthly Exam 10 | Final Exam 70.

12. Learning and Teaching Resources

Required Textbooks	Riad Aziz Hadi (1983). Human Rights: Its Development and Content. Al-Atak Company, Cairo.
Recommended Books	Human Rights Watch publications



SECOND YEAR — ADDITIONAL COURSE (ADDENDUM)

Department of Medical Laboratory Techniques | 2025–2026



Course Description Form — Ba'ath Party Crimes in Iraq

1. Course Name	Ba'ath Party Crimes in Iraq (جرائم نظام البعث في العراق)
2. Course Code	ATU-13-MLT-217-C-ME
3. Semester / Year	First Course / Second Year 2025–2026
4. Description Date	2025-12-30
5. Attendance Mode	In-Person
6. Credit Hours / Units	1 / 1
7. Course Coordinator	Asst. Lect. Dr. Jamal Abdul Amir
Email	—

8. Course Objectives

- Familiarize the student with the fundamental concepts of the subject and its scientific aspects.
- Increase efficiency and effectiveness of knowledge.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration – Cooperative learning
- Problem solving – Simulation – Brainstorming – Role-playing – Collaborative workshops

10. Course Structure

Weeks	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation
1–3	1	Student familiarizes with Ba'ath Party crimes and how to face contemporary challenges	Classification of Ba'ath Party Crimes • Introduction and historical background • Categories of crimes and contemporary challenges facing them	Lecture delivery • Q&A • Brainstorming	Written & oral exams • Reports
4–6	1	Student familiarizes with Ba'ath Party crimes according to documentation	Ba'ath Regime Crimes According to Iraq's Supreme Criminal Court (Year 1992) • Documentation of crimes per the Iraqi Criminal Court law	Lecture delivery • Q&A • Brainstorming	Written & oral exams • Reports

7-9	1	Student familiarizes with Ba'ath Party crimes	Types of International Crimes • War crimes • Crimes against humanity • Genocide • Aggression crimes	Lecture delivery • Q&A • Brainstorming	Written & oral exams • Reports
10-12	1	Student familiarizes with Ba'ath Party crimes	Decisions Issued by the Supreme Criminal Court • Landmark judgments and their legal basis	Lecture delivery • Q&A • Brainstorming	Written & oral exams • Reports

11. Course Evaluation

100 marks: Attendance 10 | Classroom Activities 10 | Monthly Exam 30 | Final Exam 70.

12. Learning and Teaching Resources

Required Textbooks	Dr. Hussein Aliyawi & Dr. Abbas Atiyyah Al-Qurayshi (2013). Documentation of Extremist Crimes. Al-Kafeel Publishers, Karbala. p.14.
Main References	Article 8 of the Rome Statute of the International Criminal Court, adopted on July 17.



THIRD YEAR — ADDITIONAL COURSES (ADDENDUM)

Department of Medical Laboratory Techniques | 2025–2026



Course Description Form — Clinical Microbiology – Advanced Techniques (ATU-13-MLT-317)

1. Course Name	Clinical Microbiology – Advanced Techniques
2. Course Code	ATU-13-MLT-317-C-ME
3. Semester / Year	Third Year 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	In-Person (On-Campus)
6. Credit Hours / Units	4 / 4
7. Course Coordinator	Asst. Lect. Dr. Qais Khedhir Abd Abbas
Email	Kais.alhadrawi@atu.edu.iq

8. Course Objectives

- Familiarize the student with fundamental concepts of clinical microbiology.
- Increase efficiency and effectiveness of laboratory data analysis.
- Achieve the goals of the Medical Laboratory Techniques Department.

9. Teaching and Learning Strategies

- Interactive organized discussion – Scientific demonstration – Cooperative learning
- Problem solving – Simulation – Brainstorming – Role-playing – Collaborative workshops

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation
1	4	Study, Knowledge & Application	Introduction to Clinical Microbiology • Scope and importance in medical diagnosis	Theoretical + Practical	Written & Practical Exams
2	4	Study, Knowledge & Application	Safety and Principles of Sterilization • Biosafety levels • PPE • Decontamination	Theoretical + Practical	Written & Practical Exams
3	4	Study, Knowledge & Application	Collection, Transport, Examination and Reporting of Specimens • Types of	Theoretical + Practical	Written & Practical Exams



			specimens • Collection procedures • Transport conditions • Laboratory report writing		
4-5	4	Study, Knowledge & Application	Culturing of Organisms – Conventional Microbiological Techniques • Culture media preparation • Plating methods • Colony counting • Incubation conditions	Theoretical + Practical	Written & Practical Exams
6-7	4	Study, Knowledge & Application	Biochemical Testing of Microorganisms • Catalase, Oxidase, Coagulase, Urease tests • Sugar fermentation tests • API systems • VITEK automated identification	Theoretical + Practical	Written & Practical Exams
8-9	4	Study, Knowledge & Application	Serological Diagnostic Techniques • Agglutination • Precipitation • ELISA • Immunofluorescence • Western Blot	Theoretical + Practical	Written & Practical Exams
10-11	4	Study, Knowledge & Application	Antibiotic Sensitivity Testing • Disk diffusion (Kirby-Bauer method) • MIC determination • E-test • Automated systems	Theoretical + Practical	Written & Practical Exams
12-13	4	Study, Knowledge & Application	Molecular Diagnostic Techniques • PCR-based identification • Real-time PCR • DNA sequencing • MALDI-TOF MS	Theoretical + Practical	Written & Practical Exams
14-15	4	Study, Knowledge & Application	Quality Control in Microbiology Laboratory • Internal and external quality control • Reference strains • ATCC standards • Result interpretation	Theoretical + Practical	Written & Practical Exams

11. Course Evaluation

Distributed out of 100: Attendance 10 | Classroom Activities 10 | Monthly Exam 20 | Final Exam 60 (Theory + Practical).



Course Description Form — Stem Cell and Embryology– Semester 2 (ATU-13-MLT-321)

1. Course Name	Tissue Pathology – Second Semester
2. Course Code	ATU-13-MLT-321-C-ME
3. Semester / Year	Second Semester / Third Year 2025–2026
4. Description Date	30-12-2025
5. Attendance Mode	Classroom + Laboratory
6. Credit Hours / Units	—
7. Course Coordinator	Asst. Lect. Abbas Hussein Obaid
Email	abbas.obaid@atu.edu.iq

8. Course Objectives

- Provide students with a comprehensive and up-to-date view on pathological science.
- Enable students to identify and analyze pathological conditions microscopically.
- Connect disease mechanisms with laboratory and clinical findings.

9. Teaching and Learning Strategies

- Lectures for theoretical concepts
- Laboratory sessions for practical applications
- Group discussions for critical thinking
- Case-based learning
- Problem-based learning

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Evaluation
1	1	Study, Knowledge & Application	Environment and Lifestyle-Related Pathology • Occupational diseases • Pollution-related diseases • Tobacco and alcohol effects	Lectures + Practical	Short exams • Practical
2	1	Study, Knowledge & Application	Nutritional Diseases • Protein-energy malnutrition • Vitamin deficiency diseases • Obesity-related pathology	Lectures + Practical	Short exams
3	1	Study, Knowledge & Application	Genetic Diseases • Single gene disorders	Lectures + Practical	Short exams



			Chromosomal abnormalities • Multifactorial diseases		
4	1	Study, Knowledge & Application	Clinical Aspects of Neoplasia • Tumor classification • Clinical presentation • Tumor diagnosis and staging	Lectures + Practical	Short exams
5	1	Study, Knowledge & Application	Molecular Basis of Cancer • Proto-oncogenes • Tumor suppressor genes • Epigenetics in cancer • Metastatic cascade	Lectures + Practical	Short exams
6	1	Study, Knowledge & Application	Diseases Caused by Viruses • Viral hepatitis • HPV-related cancers • HIV pathology • Herpes virus diseases	Lectures + Practical	Short exams
7-8	1	Study, Knowledge & Application	Bone and Joint Pathology • Osteoporosis • Rheumatoid arthritis • Osteosarcoma • Gout	Lectures + Practical	Short exams
9-10	1	Study, Knowledge & Application	Central Nervous System Pathology • Meningitis • Encephalitis • Brain tumors • Multiple sclerosis • Parkinson's disease	Lectures + Practical	Short exams
11-12	1	Study, Knowledge & Application	Skin Pathology • Psoriasis • Melanoma • Basal cell carcinoma • Squamous cell carcinoma • Inflammatory skin diseases	Lectures + Practical	Short exams
13-14	1	Study, Knowledge & Application	Hematological Malignancies • Lymphoma (Hodgkin and Non-Hodgkin) • Acute and chronic leukemia • Multiple myeloma	Lectures + Practical	Short exams
15	1	Study, Knowledge &	Comprehensive Review and	Lectures + Practical	Final review exam

	Application	General Pathology of Infectious Diseases • Integration of pathological mechanisms across organ systems	
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11. Course Evaluation

100 marks: %43 Effort + 35 Theory + 22 Practical.

12. Learning and Teaching Resources

Required Textbooks	Pathologic Basis of Diseases, 8th Ed. (2012) Junqueira's Basic Histology, 15th Ed. (2018) Pathology Illustrated, 17th Ed. (2011)
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