

**Academic program Description form  
(2026\_2025)**

**University Name : National University of Science and Technology**

**College Name : Health and medical techniques**

**Name of academic or professional program :Medical laboratory techniques**

**Name of final degree: Bachelor of Medical laboratory techniques**

**Study system : (semester and courses )**

**Description preparation date : 2025/9/5**

**File completion date : 2025/9/15**

**Name of the Dean of the college :**

**Date : 2025/9/ 15**



**signature :**

**Name of the scientific Assistant :**

**Date : 2025/9/15**

**signature:**



**File checked by**

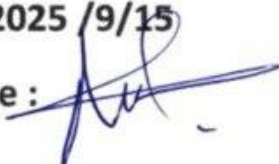
**Quality Assurance and university performance Division**

**Name of director of Quality Assurance and university performance Division :**

**Ashjan Rashed Neama**

**Date : 2025 /9/15**

**Signature :**



**Deans approval**

## **:Program vision**

**The Department of Medical Laboratory Technologies is an important and effective window to provide the community's need for specialized medical personnel in support of health, research and educational institutions, in addition to the optimal investment of the skills of faculty members and their reflection on students through applied health scientific research and studies, so that our outputs have technical and professional expertise, having obtained the best training and derivation of academic expertise to keep pace with the continuous development of .laboratory technologies**

## **:Program message**

**The mission of the Department of Medical Laboratory Technologies is to meet the needs of health institutions for young, specialized personnel with scientific specifications and standards, as well as to prepare these young graduates to work within these institutions in a way that represents an important change through development and modernization in support of the health sectors, as well as to develop faculty members and students in the fields of scientific research and knowledge and to strive to open them up with a modern global scientific balance in a way that serves health institutions to build horizons of practical scientific cooperation with .related institutions**

## **:Program objectives**

**Acquiring all the basic knowledge and skills in the field of pathology and laboratories, activating the college's role in establishing the principles of community participation and volunteer work for our students in order to use modern educational technologies.**

**Developing educational curricula to keep pace with modern scientific and technological changes, in order to serve the interests of the labor market and to achieve high value for all segments of society benefiting from education.**

**Establishing cooperative and interactive links between the college and other similar colleges locally, regionally, and globally to maintain alignment with the goals of higher education in Iraq and the world, as we are part of this evolving educational system.**

**Providing medical services to citizens through modern, specialized scientific laboratories run by young staff**

## **:Program accreditation**

## **:Other external influences**

## **:Program structure**

<b>Observations</b>	<b>Percentage</b>	<b>Study unit</b>	<b>Number of courses</b>	<b>Program structure</b>
<b>essential</b>	<b>%50</b>	<b>30</b>	<b>15</b>	<b>Institutional requirements</b>
<b>essential</b>	<b>%26.31</b>	<b>184</b>	<b>39</b>	<b>College requirements</b>
<b>essential</b>	<b>%25.23</b>	<b>214</b>	<b>54</b>	<b>Department requirements</b>
<b>essential</b>	<b>Two months during the summer vacation for the second and third stages</b>			<b>Summer training</b>

## **:Program description**

**First phase of the academic year 2025-2026**

**First stage/first semester**

<b>Units</b>	<b>Number of weekly hours</b>	<b>Study material</b>	<b>T</b>
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	Rate	practical	Theory			
4	7	5	2	General Chemistry 1	General Chemistry	1
2	2	-	2	Medical terminology	Medical Terminology	2
4	7	5	2	Human biology 1	Human Biology 1	3
4	6	4	2	Laboratory instruments 1	Laboratory equipment 1	4
2	2	-	2	Medical ethics	Professional conduct	5
2	3	2	1	Computer Applications 1	1 Principles	6
2	2	-	2	Human rights and democracy	Human rights and democracy	7
2	2	-	2	English language	English language	8
22	31	16	15	the total		

### First stage/Second semester

Units	Number of weekly hours			Study material	T	
	Rate	practical	Theory			
4	7	5	2	General chemistry 2	General Chemistry 2	1
4	7	5	2	Anatomy	Anatomy	2
4	7	5	2	Human biology 2	Human Biology 2	3
4	6	4	2	Laboratory instruments 2	Laboratory equipment 2	4
2	3	2	1	Computer Applications 2	Computer Principles 2	5
2	2	-	2	Arabic language	Arabic	6
20	32	21	11	the total		

second phase of the academic year 2025-2026

### Phase Two/First Semester

Units	Number of weekly hours			Study material	T	
	Rate	practical	Theory			
4	6	4	2	Medical Bacteriology 1	Medical Bacteriology 1	1
4	6	4	2	Biochemistry 1	Biochemistry 1	2

4	6	4	2	Human physiology 1	Human Physiology 1	3
4	6	4	2	Histology 1	Histology 1	4
4	6	4	2	Molecular Biology	Molecular biology	5
4	6	4	2	Medical Parasitology 1	Medical Parasitology 1	6
2	2	-	2		Crimes of the Ba'ath regime in Iraq	7
26	38	24	14		Total	

### Second stage/Second semester

Units	Number of weekly hours			Study material		T
	Rate	practical	Theory			
4	6	4	2	Medical Bacteriology 2	Medical Bacteriology 2	1
4	6	4	2	Biochemistry 2	Biochemistry 2	2
4	6	4	2	Human physiology 2	Human Physiology 2	3
4	6	4	2	Histology 2	Histology 2	4
4	6	4	2	Medical Parasitology 2 & Entomology	and Medical parasites insects 2	5
2	3	2	1	Descriptive Biostatistics	Biostatistics Descriptive	6
2	2	-	2	Arabic language	Arabic language	7
2	3	2	1	Computer Applications	Computer applications	8
26	38	24	14		Total	

## Third phase of the academic year 2025-2026

### Third stage/First semester of the academic year 2025-2026

Units	Number of weekly hours			Study material		T
	Rate	practical	Theory			
3	4	2	2	Histopathology 1	Histopathology 1	1
3	4	2	2	Hematology 1	Hematology 1	2
4	6	4	2	Medical Virology	Medical virology	3
4	6	4	2	Metabolic Disorders	Metabolic disorders	4
4	6	4	2	Medical Genetics 1	Medical Genetics 1	5
4	6	4	2	Immunology 1	Immunology 1	6
3	4	2	2	Advanced laboratory technique	Advanced laboratory techniques	7
2	3	2	1	Computer Applications1	Computer Applications 1	8
27	39	24	15		Total	

### Third stage/Second semester of the academic year 2025-2026

Units	Number of weekly hours			Study material		T
	Rate	practical	Theory			
3	4	2	2	Histopathology 2	Histopathology 2	1
3	4	2	2	Hematology 2	Hematology 2	2
4	6	4	2	Medical Mycology	Medical mycology	3
4	6	4	2	Metabolic Disorders	Clinical Endocrinology	4
4	6	4	2	Medical Genetics 2	Medical Genetics 2	5
4	6	4	2	Immunology 2	Immunology 2	6
2	4	3	1	Analytical Biostatistics	Analytical Biostatistics	7
2	3	2	1	Computer Applications 2	Computer Applications 2	8
26	39	25	14		Total	

## Medical Laboratory Techniques / Fourth Year / Annual

### Fourth Stage / First Semester

Units	Number of weekly hours			Study material		T
	the total	practical	Theory			
4	6	4	2	Clinical Immunology1	Clinical Immunology1	1
4	6	4	2	Diagnostic Bacteriology1	Diagnostic Bacteriology1	2
4	6	4	2	Clinical Enzymology1	Clinical Enzymology1	3
4	6	4	2	Diagnostic Parasitology1	Diagnostic parasitology1	4
4	6	4	2	Blood Transfusion	transfusion	5
4	6	4	2	Pathology	pathology	6
2	2	-	2	Professional Ethics	Professional ethics	7

<b>1</b>	<b>1</b>	<b>-</b>	<b>1</b>	<b>Research Methods</b>	<b>Research methods</b>	<b>8</b>
<b>27</b>	<b>39</b>	<b>24</b>	<b>15</b>		<b>Total</b>	

**Fourth Stage / Second Semester**

<b>Units</b>	<b>Number of weekly hours</b>			<b>Study material</b>		<b>T</b>
	<b>the total</b>	<b>practical</b>	<b>Theory</b>			
<b>4</b>	<b>6</b>	<b>4</b>	<b>0</b>	<b>Clinical Immunology</b>	<b>Clinical Immunology</b>	<b>1</b>
<b>4</b>	<b>6</b>	<b>4</b>	<b>0</b>	<b>Diagnostic Bacteriology</b>	<b>Diagnostic bacteriology</b>	<b>0</b>
<b>2</b>	<b>0</b>	<b>-</b>	<b>2</b>	<b>Stem cell &amp; Embryology</b>	<b>Stem cell science and science embryos</b>	<b>2</b>
<b>4</b>	<b>6</b>	<b>4</b>	<b>0</b>	<b>Diagnostic Parasitology</b>	<b>Diagnostic parasitology</b>	<b>4</b>
<b>4</b>	<b>6</b>	<b>4</b>	<b>0</b>	<b>Clinical Chemistry</b>	<b>Clinical Chemistry</b>	<b>5</b>
<b>4</b>	<b>6</b>	<b>4</b>	<b>0</b>	<b>Antibiotic Resistance &amp; Infection Control</b>	<b>Antibiotic resistance and infection control</b>	<b>6</b>
<b>1</b>	<b>1</b>		<b>1</b>	<b>Laboratory Management</b>	<b>Laboratory Management</b>	<b>7</b>
<b>4</b>	<b>6</b>	<b>6</b>	<b>-</b>	<b>Graduation Project</b>	<b>Graduation project</b>	<b>8</b>

## **:Expected learning outcomes for the program**

<b>:Knowledge</b>	
<p><b>Knowledge and understanding of the types of laboratory equipment and how to operate, use, maintain and preserve them.</b></p> <ul style="list-style-type: none"> <li>• <b>Knowledge and understanding of the main parts and accessories of laboratory equipment and the function of each part.</b></li> <li>• <b>Knowledge and understanding of the principles of medical analysis, and how to handle laboratory equipment and avoid its harmful effects.</b></li> <li>• <b>Knowledge and understanding of human anatomy and its functions.</b></li> <li>• <b>Knowledge and understanding of how to use laboratory materials and avoid the dangers resulting from them.</b></li> <li>• <b>Knowledge and understanding of the types of medical analysis and clinical diagnostic equipment</b></li> </ul> <p><b>Knowledge and understanding of the • developments in X-ray equipment and keeping up with them</b></p>	<ul style="list-style-type: none"> <li>• <b>Knowledge and understanding of the types of laboratory equipment and how to .operate, use, maintain and preserve them</b></li> <li>• <b>Knowledge and understanding of the main parts and accessories of laboratory .equipment and the function of each part</b></li> <li>• <b>Knowledge and understanding of the principles of medical analysis, handling laboratory equipment and how to avoid its .harmful effects</b></li> <li>• <b>Knowledge and understanding of human .anatomy and its functions</b></li> <li>• <b>Knowledge and understanding of how to use laboratory materials and avoid the .dangers resulting from them</b></li> <li>• <b>Knowledge and understanding of the types of medical analysis and clinical diagnostic equipment</b></li> <li>• <b>Knowledge and understanding of the developments in X-ray equipment and .keeping up with them</b></li> </ul>
<b>:Skills</b>	
<p><b>Thinking based on sound scientific principles and the ability to learn independently.</b></p> <ul style="list-style-type: none"> <li>• <b>Working to solve technical problems in a scientific and intellectual manner within his field of specialization.</b></li> <li>• <b>The ability to perform analyses correctly and with high quality.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Thinking based on sound scientific principles and .the ability to learn independently</b></li> <li>• <b>Working to solve technical problems in a scientific and intellectual manner within his field of .specialization</b></li> <li>• <b>The ability to perform analyses correctly and with • high quality</b></li> </ul>

<ul style="list-style-type: none"> <li>• Applying different methods to conduct laboratory analyses with high accuracy.</li> <li>Avoid damage caused by materials used in the laboratory</li> </ul>	<ul style="list-style-type: none"> <li>• Applying different methods to conduct laboratory analyses with high accuracy</li> <li>• Avoid damage caused by materials used in the laboratory</li> </ul>

## **:Values**

<p><b>Focus on:</b></p> <p>Academic integrity (such as honesty in performing assignments and exams.</p> <p>Professional ethics (mutual respect, honesty, fairness)</p> <p>•</p> <p>Building positive relationships in the university and work environment</p> <p>work environment development:</p> <p>Self-discipline and commitment.</p> <p>Team spirit and cooperation with colleagues.</p> <p>Communication skills (oral and written) with colleagues, reviewers and patients</p> <p>Managing time efficiently to achieve:</p> <p>Academic excellence.</p> <p>Success at work.</p> <p>Psychological and social well-being.</p> <p>The ability to prioritize and the flexibility to deal with stress</p> <p>Enhancement:</p> <p>Self-awareness and appreciation of potential.</p> <p>Readiness for continuous learning and self-development.</p> <p>Working as a team.</p> <p>Taking responsibility and leading in different situations</p>	<ul style="list-style-type: none"> <li>• Promoting integrity, ethics, and mutual respect among students, faculty, and administrative staff within the university environment, and among technicians and their colleagues</li> <li>• His subordinates and patients in the work environment</li> <li>• Dedication to hard work, cooperation and effective communication</li> <li>• Achieving a balance between academic, professional and personal life</li> <li>• Building self-confidence, personal development, teamwork, and leadership</li> <li>• Respect for diversity and peaceful coexistence, and contribution to society</li> </ul>

## **:Teaching and learning strategies**

- Theoretical lectures
- Practical laboratories
- Systematic training at the university and the Department of Medical Laboratories
- Summer training in government and private hospitals and private clinics

## **:Evaluation methods**

- Oral tests
- Term exams
- Final exams
- Scientific reports

.Extracurricular activities •

## **:Faculty**

### **Faculty members**

<b>Faculty preparation</b>		<b>Special requirements or skills</b>	<b>Specialization</b>		<b>academic rank</b>
<b>lecturer</b>	<b>angel</b>		<b>private</b>	<b>general</b>	
<b>10</b>	<b>2</b>	-	-	<b>12</b>	<b>PhD</b>
<b>25</b>	<b>19</b>	-	<b>10</b>	<b>44</b>	<b>Master's</b>

## **:Professional development**

### **Orienting new faculty members**

New faculty members are guided through a specific orientation program for new members at the university. This aims to

The program aims to guide and assist them in understanding the work environment, available resources, .policies, and procedures

.The academy also assigns academic advisors to help guide and develop new members

### **Professional development of faculty members**

Conducting numerous training programs, courses, and workshops for new faculty members in the department, which include

Training programs in teaching skills, scientific research, academic advising, and leadership development. Also

Working to involve them in collaborative research and projects; such as preparing joint research with their colleagues at the university, or in

Academic conferences, to enhance academic skills and expertise, expand knowledge and develop .research skills

### **:Admission criteria**

The admission criteria are determined according to the admission criteria of the Ministry of Higher :Education and Scientific Research

The student's overall average in preparatory school .1

Student's desire .2

Department capacity .3

### **:Key sources of information about the program**

- .1 The textbooks prepared by the Ministry of Higher Education and Scientific Research, given that the college will be subject to the twinning program  
With the Middle Technical College / Baghdad**
- .2 Updating the curricula according to what scientific curricula are based on**
- .3 Search the internet for the latest scientific updates**

### **:Program development plan**

- .1 Reviewing recent developments and using video lectures on the display screen**
- .2 Using the Internet to present old and used methods in the field of laboratory equipment and methods of conducting analyses with it**
- .3 Using electronic simulation programs to illustrate methods of conducting laboratory analyses**
- .4 Training on laboratory equipment**

### Program Skills Plan

Learning outcomes required from the program															
Values				Skills				Knowledge				Essential or optional	Course Name	Course code	Year/Level
Q4	Part3	Part2	Part1	B4	B3	B2	B1	A4	A3	A2	A1			1	First Stage / First Semester
			✓				✓				✓	essential	General Chemistry	2	
			✓				✓				✓	essential	Medical Terminology	3	
			✓				✓				✓	essential	Human Biology 1	4	
			✓				✓				✓	essential	Laboratory equipment 1	5	
			✓				✓				✓	essential	Professional conduct	6	
			✓				✓				✓	essential	Principles 1	7	
			✓				✓				✓	essential	Human rights and democracy	8	

			✓				✓				✓	essential	General Chemistry 2	1	First stage/Second semester
			✓				✓				✓	essential	Anatomy	2	
			✓				✓				✓	essential	Human Biology 2	3	
			✓				✓				✓	essential	Laboratory equipment 2	4	
			✓				✓				✓	essential	Computer Principles 2	5	
			✓				✓				✓	essential	Arabic	6	

### Program Skills Plan

#### Learning outcomes required from the program

Values				Skills				Knowledge				Essential or optional	Course Name	Course code	Year/Level
Q4	Part 3	Part 2	Part 1	B4	B3	B2	B1	A4	A3	A2	A1	essential	Medical Bacteriology 1	1	Phase Two / Chapter One
												essential	Biochemistry 1	2	
			✓				✓				✓	essential	Human Physiology 1	3	
			✓				✓				✓	essential	Histology 1	4	
			✓				✓				✓	essential	Molecular biology	5	
			✓				✓				✓	essential	Medical Parasitology 1	6	
			✓				✓				✓	essential	Crimes of the Ba'ath regime in Iraq	7	

			✓				✓				✓	essential	Medical Bacteriology 2	1	Phase Two/Second Semester
			✓				✓				✓	essential	Biochemistry 2	2	
			✓				✓				✓	essential	Human Physiology 2	3	

			✓				✓			✓	essential	Histology 2	4
			✓				✓			✓	essential	Medical parasites insects 2 and	5
			✓				✓			✓	essential	Descriptive Biostatistics	6
			✓				✓			✓	essential	Arabic language	7
			✓				✓			✓	essential	Computer applications	8

Program Skills Plan															
Learning outcomes required from the program												Essential or optional	Course Name	Course code	Year/Level
Values			Skills				Knowledge								
Q4	Part 3	Part 2	Part 1	B4	B3	B2	B1	A4	A3	A2	A1				
												essential	Histopathology 1	1	Phase Three / Chapter One
												essential	Hematology 1	2	
			✓				✓				✓	essential	Medical virology	3	
			✓				✓				✓	essential	Metabolic disorders	4	
			✓				✓				✓	essential	Medical Genetics 1	5	
			✓				✓				✓	essential	Immunology 1	6	

			✓				✓				✓	essential	Advanced laboratory techniques	7	
			✓				✓				✓	essential	Computer Applications 1	8	

			✓				✓				✓	essential	Histopathology 2	1	<b>Phase Three / Chapter Two</b>
			✓				✓				✓	essential	Hematology 2	2	
			✓				✓				✓	essential	Medical mycology	3	
			✓				✓				✓	essential	Clinical Endocrinology	4	
			✓				✓				✓	essential	Medical Genetics 2	5	
			✓				✓				✓	essential	Immunology 2	6	
			✓				✓				✓	essential	Analytical Biostatistics	7	
			✓				✓				✓	essential	Computer Applications 2	8	

<b>Program Skills Plan</b>															
<b>Learning outcomes required from the program</b>												<b>Essential or optional</b>	<b>Course Name</b>	<b>Course code</b>	<b>Year/Level</b>
<b>Values</b>			<b>Skills</b>				<b>Knowledge</b>								
<b>Q 4</b>	<b>Part 3</b>	<b>Part 2</b>	<b>Part 1</b>	<b>B 4</b>	<b>B 3</b>	<b>B 2</b>	<b>B 1</b>	<b>A 4</b>	<b>A 3</b>	<b>A 2</b>	<b>A 1</b>				
												essential	Clinical Immunology	1	<b>Fourth Stage / First Semester</b>
												essential	Diagnostic bacteria	2	
			✓				✓				✓	essential	Advanced Clinical Chemistry	3	
			✓				✓				✓	essential	Medical parasitology	4	

			✓				✓				✓	<b>essential</b>	<b>transfusion</b>	<b>5</b>	
			✓				✓				✓	<b>essential</b>	<b>Histopathology</b>	<b>6</b>	
			✓				✓				✓	<b>essential</b>	<b>English language</b>	<b>7</b>	
			✓				✓				✓	<b>essential</b>	<b>Laboratory management and teaching research methods</b>	<b>8</b>	
			✓				✓				✓	<b>essential</b>	<b>Professional ethics</b>	<b>9</b>	

<b>1. Human Anatomy :Course Name</b>	
<b>2. : Course code</b>	
<b>3. Year : Semester 2/ 2025-2026 /</b>	
<b>4. Date this description was prepared : 15/9/2025</b>	
<b>5. Available attendance formats : In-person</b>	
<b>6. Total study hours/total units : 2 hours for the theoretical component/6 hours for the practical component per week</b>	
<b>Total number of units: 4 units / (hours per semester 120)</b>	
<b>7. : Name of the course coordinator (if there is more than one, please state)</b>	
:Email <a href="mailto:safajass41@gmail.com">safajass41@gmail.com</a>	<b>Safaa Jassim Ta'ma / For the theoretical aspect</b>
:Email <a href="mailto:hushamfatimah208@gmail.com">hushamfatimah208@gmail.com</a>	
<b>8. Course Objectives</b>	
<b>To provide students with ample information about the anatomy of the human body, its components and systems in .general -1</b>	<b>Course Objectives</b>
<b>To enable the student to understand and analyze the parts .and systems of the human body -2</b>	
<b>Linking the medical and health information of the remaining subjects and courses with the human body and .its structure -3</b>	

## 9. : Learning and teaching strategies

The education in this program includes theoretical education that focuses on .1 studying scientific problems in a purely scientific manner aimed at understanding the basis of the problem and searching for solutions to it, and practical education that provides practical experience in conducting experiments and research through .the use of methods approved in conducting scientific research

Learning, in both its theoretical and practical aspects, depends on cooperation .2 between the student and the professor to understand the lesson as much as possible and to overcome obstacles that hinder the student's understanding or impede the .conduct of his experiments in the laboratory

Students were urged to use books and scientific articles, whether physical or .3 electronic, as they greatly help in retaining information and allow for discussion and .conclusions

## 10. Course structure (theoretical part)

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Daily exams and discussions The report	The lecture was presented via PowerPoint and discussed with the .students	<b>Introduction to anatomy and human body</b>	<ul style="list-style-type: none"> <li>• The student distinguishes the general structure of the human body and its main divisions using basic anatomical terminology.</li> <li>• The student explains the different body systems such as: skeletal, muscular, nervous, and circulatory, while clarifying the relationship between structure and function.</li> <li>• The student applies anatomical knowledge practically to models or drawings to determine the positions of organs and the anatomical relationships between them.</li> </ul>	2	the first

<p><b>Daily exams and discussions</b></p> <p><b>The report</b></p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p>	<p><b>Tissues and membranes</b></p>	<ul style="list-style-type: none"> <li>• The student <b>distinguishes between the main types of tissues in the human body</b>: epithelial, connective, muscular, and nervous, in terms of structure and function.</li> <li>• The student <b>explains the basic properties and functions of body membranes</b> such as mucous, serous, cutaneous, and alveolar membranes.</li> <li>• The student <b>applies theoretical skills in classifying tissues and membranes</b> through laboratory examination of microscopic slides or anatomical drawings.</li> </ul>	<p><b>2</b></p>	<p><b>the second</b></p>
<p><b>Daily exams and discussions</b></p> <p><b>The report</b></p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p>	<p><b>Upper limb, lower limb, thorax</b></p>	<ul style="list-style-type: none"> <li>• The student <b>identifies the main anatomical structures of the upper and lower limbs and the rib cage</b> , including bones, muscles, joints, and nerves.</li> <li>• The student <b>explains the motor functions and anatomical integration</b> of the upper limb, lower limb, and chest in the context of movement, support, and respiration.</li> <li>• The student <b>connects the anatomical structure and the functional location of organs and components</b> in these areas using anatomical drawings or practical models.</li> </ul>	<p><b>2</b></p>	<p><b>the third</b></p>
<p><b>Daily exams and discussions</b></p> <p><b>The report</b></p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p>	<p><b>Abdomen, pelvis, head and neck</b></p>	<ul style="list-style-type: none"> <li>• The student <b>identifies the basic anatomical structures of the abdomen, pelvis, head and neck</b> , including organs, blood vessels and nerves.</li> <li>• The student <b>explains the anatomical and functional relationship between the organs</b> in each region, and their role in vital processes such as</li> </ul>	<p><b>2</b></p>	<p><b>Fourth</b></p>

			<p>digestion, urination, and respiration.</p> <ul style="list-style-type: none"> <li>• <b>The student uses models or drawings to accurately trace anatomical locations</b> and understand the interrelationship between these areas in the clinical context.</li> </ul>		
<p><b>Daily exams and discussions</b></p> <p><b>The report</b></p>	<p><b>The lecture was presented via PowerPoint and discussed with the .students</b></p>	<p><b>Musculoskeletal system: Bones joints and muscles</b></p>	<ul style="list-style-type: none"> <li>• <b>The student distinguishes the components of the musculoskeletal system</b> , including bones, joints, and muscles, in terms of structure and function.</li> <li>• <b>The student explains the mechanism of movement and integration between bones, joints and muscles</b> and their role in supporting the body and executing voluntary movements.</li> <li>• <b>The student applies theoretical knowledge practically</b> by identifying musculoskeletal structures in models, drawings, or microscopic slides.</li> </ul>	<b>2</b>	<b>Fifth</b>
<p><b>Daily exams and discussions</b></p> <p><b>The report</b></p>	<p><b>The lecture was presented via PowerPoint and discussed with the .students</b></p>	<p><b>Digestive system: Digestive tract, Accessories and glands</b></p>	<ul style="list-style-type: none"> <li>• <b>The student knows the basic components of the digestive system</b> , including the digestive tract and auxiliary organs such as the liver, pancreas, and salivary glands.</li> <li>• <b>The student explains the sequence of the digestive process</b> and the role of each part of the digestive tract and accessory organs in digestion and absorption.</li> <li>• <b>The student identifies the anatomical positions of the digestive organs</b> using models or drawings and explains their relationship to neighboring organs.</li> </ul>	<b>2</b>	<b>Sixth</b>

<p><b>Daily exams and discussions</b></p> <p><b>The report</b></p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p>	<p><b>Cardiovascular system: heart, blood vessels</b></p>	<ul style="list-style-type: none"> <li>• The student learns about the anatomical structures of the heart and blood vessels , including the heart chambers, valves, arteries, and major veins .</li> <li>• The student explains the major and minor circulatory systems and the role of both the heart and blood vessels in transporting blood and nourishing tissues.</li> <li>• The student identifies the anatomical locations of the heart and major blood vessels and demonstrates an understanding of their relationship to surrounding organs using models or</li> </ul>	<p><b>2</b></p>	<p><b>Seventh</b></p>
<p><b>Daily exams and discussions</b></p> <p><b>The report</b></p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p>	<p><b>lymphatic system.</b></p>	<p>The student knows the components of the lymphatic system , such as the lymphatic vessels, lymph nodes, spleen, and thymus gland.</p> <p>The student explains the function of the lymphatic system in fluid drainage, immune defense , and its role in restoring the body's fluid balance.</p> <p>The student identifies the lymphatic pathways and major nodes anatomically , and characterizes their location and relationship to other organs and systems using anatomical models or diagrams.</p>	<p><b>2</b></p>	<p><b>Eighth</b></p>

<p><b>Daily exams and discussions</b></p> <p><b>The report</b></p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p>	<p><b>Respiratory system</b></p>	<ul style="list-style-type: none"> <li>• The student knows the components of the respiratory system , including the nose, pharynx, larynx, trachea, bronchi, and lungs.</li> <li>• The student explains the mechanism of breathing , gas exchange, and the role of each part of the respiratory system in the respiratory process.</li> <li>• The student accurately identifies the anatomical structures of the respiratory system using models or drawings, and distinguishes its relationship to the surrounding organs.</li> </ul>	<p><b>2</b></p>	<p><b>Ninth</b></p>
<p><b>Daily exams and discussions</b></p> <p><b>The report</b></p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p>	<p><b>Nervous system: central nervous system, peripheral nervous system</b></p>	<ul style="list-style-type: none"> <li>• The student learns about the components of the central and peripheral nervous systems , including the brain, spinal cord, and peripheral nerves.</li> <li>• The student explains the functions of each part of the central and peripheral nervous systems and their role in motor and sensory control and regulation of body functions.</li> <li>• The student identifies the main anatomical structures of the nervous system using models or drawings and explains the relationships between its various components.</li> </ul>	<p><b>2</b></p>	<p><b>tenth</b></p>

<p><b>Daily exams and discussions</b></p> <p><b>The report</b></p>	<p>The lecture was presented via <b>PowerPoint</b> and discussed with the <b>.students</b></p>	<p><b>Endocrine system</b></p>	<ul style="list-style-type: none"> <li>• <b>The student learns about the major endocrine glands</b> such as the pituitary, thyroid, adrenal, and pancreas glands, and their location in the body.</li> <li>• <b>The student explains the role of the endocrine glands in regulating vital functions</b> through the secretion of hormones and their effect on different tissues and organs.</li> <li>• <b>The student identifies the anatomical relationships of the endocrine glands</b> and uses models or drawings to illustrate their location and function.</li> </ul>	<p><b>2</b></p>	<p><b>eleventh</b></p>
<p><b>Daily exams and discussions</b></p> <p><b>The report</b></p>	<p>The lecture was presented via <b>PowerPoint</b> and discussed with the <b>.students</b></p>	<p><b>Special senses</b></p>	<ul style="list-style-type: none"> <li>• <b>The student learns the basic anatomical components of the special senses</b> such as the eye, ear, nose, tongue, and skin.</li> <li>• <b>The student explains the mechanism of action of each of the special senses</b> and its role in receiving and processing sensory stimuli.</li> </ul>	<p><b>2</b></p>	<p><b>twelfth</b></p>

			<ul style="list-style-type: none"> <li>• <b>The student identifies the locations and parts of the sensory organs.</b> Using anatomical models or diagrams, he explains their functional relationships.</li> </ul>		
<p><b>Daily exams and discussions</b></p> <p>The report</p>	<p>The lecture was presented via PowerPoint and followed by discussion.</p>	<p><b>Urinary system</b></p>	<ul style="list-style-type: none"> <li>• <b>The student learns the main anatomical structures of the urinary system</b>, including the kidneys, ureters, bladder, and urethra.</li> <li>• <b>The student explains the function of the urinary system in filtering the blood, removing liquid waste from the body, and regulating fluid balance.</b></li> <li>• <b>The student identifies the location of the urinary structures and their anatomical relationships</b> using anatomical models or drawings.</li> </ul>	2	thirteenth
<p><b>Daily exams and discussions</b></p> <p>The report</p>	<p>The lecture was presented via PowerPoint and</p>	<p><b>Reproductive system</b></p>	<ul style="list-style-type: none"> <li>• <b>The student learns the main anatomical structures of the male and female reproductive systems</b>, including</li> </ul>	2	fourteenth

	discussed with the .students		<p>the internal and external reproductive organs.</p> <ul style="list-style-type: none"> <li>• The student explains the physiological functions of the reproductive system such as gamete production, fertilization, and supporting embryonic growth.</li> <li>• The student identifies the locations and parts of the reproductive system using anatomical models or drawings and explains the anatomical relationships associated with them.</li> </ul>		
<p>Daily exams and discussions</p> <p>The report</p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p>	<p><b>Gynecology, pregnancy, childbirth, Embryology, Childhood, growth and development</b></p>	<ul style="list-style-type: none"> <li>• The student learns the basics of gynecology and obstetrics , including the functional anatomy of the female reproductive system, and the stages of pregnancy and childbirth.</li> <li>• The student explains the stages of fetal development from fertilization to birth , in addition to the basic developments in</li> </ul>	2	fifteenth

			<p>childhood and child growth.</p> <ul style="list-style-type: none"> <li>• <b>The student describes the factors affecting the normal growth and development of the child</b> and identifies common health indicators and illnesses in different stages of childhood.</li> </ul>		
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**.11 Course structure (practical part)**

<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
<b>Daily exams</b>	<b>The lecture was presented via PowerPoint and discussed with the .students</b>	<b>Introduction to anatomy and human body</b>	<ul style="list-style-type: none"> <li>• <b>The student distinguishes the general structure of the human body and its main divisions</b> using basic anatomical terminology.</li> <li>• <b>The student explains the different body systems</b> such as: skeletal, muscular, nervous, and circulatory, while clarifying the relationship between structure and function.</li> <li>• <b>The student applies anatomical knowledge practically</b> to models or drawings to determine the positions of organs and the anatomical relationships between them.</li> </ul>	<b>6</b>	<b>the first</b>
<b>discussion</b>	<b>The lecture was presented via PowerPoint and discussed</b>	<b>Tissues and membranes</b>	<ul style="list-style-type: none"> <li>• <b>The student distinguishes between the main types of tissues in the human body:</b> epithelial, connective, muscular, and nervous, in terms of structure and function.</li> <li>• <b>The student explains the basic properties and</b></li> </ul>	<b>6</b>	<b>the second</b>

	with the .students		<p><b>functions of body membranes</b> such as mucous, serous, cutaneous, and alveolar membranes.</p> <ul style="list-style-type: none"> <li>• The student applies <b>theoretical skills in classifying tissues and membranes</b> through laboratory examination of microscopic slides or anatomical drawings.</li> </ul>		
discussion	The lecture was presented via PowerPoint and discussed with the .students	<b>Upper limb, lower limb, thorax</b>	<ul style="list-style-type: none"> <li>• The student identifies <b>the main anatomical structures of the upper and lower limbs and the rib cage</b> , including bones, muscles, joints, and nerves.</li> <li>• The student explains <b>the motor functions and anatomical integration</b> of the upper limb, lower limb, and chest in the context of movement, support, and respiration.</li> <li>• The student connects <b>the anatomical structure and the functional location of organs and components</b> in these areas using anatomical drawings or practical models.</li> </ul>	6	the third
Daily exams	The lecture was presented via PowerPoint and discussed with the .students	<b>Abdomen, pelvis, head and neck</b>	<ul style="list-style-type: none"> <li>• The student identifies <b>the basic anatomical structures of the abdomen, pelvis, head and neck</b> , including organs, blood vessels and nerves.</li> <li>• The student explains <b>the anatomical and functional relationship between the organs</b> in each region, and their role in vital processes such as digestion, urination, and respiration.</li> <li>• The student uses <b>models or drawings to accurately trace anatomical locations</b> and understand the interrelationship between these areas in the clinical context.</li> </ul>	6	Fourth

<p><b>Report</b></p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p>	<p><b>Musculoskeletal system: Bones joints and muscles</b></p>	<ul style="list-style-type: none"> <li>• The student distinguishes the components of the musculoskeletal system , including bones, joints, and muscles, in terms of structure and function.</li> <li>• The student explains the mechanism of movement and integration between bones, joints and muscles and their role in supporting the body and executing voluntary movements.</li> <li>• The student applies theoretical knowledge practically by identifying musculoskeletal structures in models, drawings, or microscopic slides.</li> </ul>	<p><b>6</b></p>	<p><b>Fifth</b></p>
<p><b>Daily exams</b></p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p>	<p><b>Digestive system: Digestive tract, Accessories and glands</b></p>	<ul style="list-style-type: none"> <li>• The student knows the basic components of the digestive system , including the digestive tract and auxiliary organs such as the liver, pancreas, and salivary glands.</li> <li>• The student explains the sequence of the digestive process and the role of each part of the digestive tract and accessory organs in digestion and absorption.</li> <li>• The student identifies the anatomical positions of the digestive organs using models or drawings and explains their relationship to neighboring organs.</li> </ul>	<p><b>6</b></p>	<p><b>Sixth</b></p>
<p><b>Report</b></p>	<p>The lecture was presented via PowerPoint and discussed</p>	<p><b>Cardiovascular system: heart, blood vessels</b></p>	<ul style="list-style-type: none"> <li>• The student learns about the anatomical structures of the heart and blood vessels , including the heart chambers, valves, arteries, and major veins.</li> <li>• The student explains the major and minor circulatory systems and the role of both the heart and blood vessels in</li> </ul>	<p><b>6</b></p>	<p><b>Seventh</b></p>

	with the .students		<p>transporting blood and nourishing tissues.</p> <ul style="list-style-type: none"> <li>• The student identifies the anatomical locations of the heart and major blood vessels and demonstrates an understanding of their relationship to surrounding organs using models or</li> </ul>		
discussion	The lecture was presented via PowerPoint and discussed with the .students	lymphatic system.	<p>The student knows the components of the lymphatic system , such as the lymphatic vessels, lymph nodes, spleen, and thymus gland.</p> <p>The student explains the function of the lymphatic system in draining fluids, immune defense , and its role in restoring the body's fluid balance.</p> <p>The student identifies the lymphatic pathways and major nodes anatomically and characterizes their , location and relationship to other organs and systems using anatomical models or diagrams.</p>	6	Eighth
discussion	The lecture was presented via PowerPoint and discussed with the .students	Respiratory system	<ul style="list-style-type: none"> <li>• The student knows the components of the respiratory system , including the nose, pharynx, larynx, trachea, bronchi, and lungs.</li> <li>• The student explains the mechanism of breathing , gas exchange, and the role of each part of the respiratory system in the respiratory process.</li> <li>• The student accurately identifies the anatomical structures of the respiratory system using models or drawings, and distinguishes its relationship to the surrounding organs.</li> </ul>	6	Ninth

<p><b>Daily exams</b></p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p>	<p><b>Nervous system: central nervous system, peripheral nervous system</b></p>	<ul style="list-style-type: none"> <li>• The student learns about the components of the central and peripheral nervous systems , including the brain, spinal cord, and peripheral nerves.</li> <li>• The student explains the functions of each part of the central and peripheral nervous systems and their role in motor and sensory control and regulation of body functions.</li> <li>• The student identifies the main anatomical structures of the nervous system using models or drawings and explains the relationships between its various components.</li> </ul>	<p><b>6</b></p>	<p><b>tenth</b></p>
<p><b>Daily exams</b></p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p>	<p><b>Endocrine system</b></p>	<ul style="list-style-type: none"> <li>• The student learns about the major endocrine glands such as the pituitary, thyroid, adrenal, and pancreas glands, and their location in the body.</li> <li>• The student explains the role of the endocrine glands in regulating vital functions through the secretion of hormones and their effect on different tissues and organs.</li> <li>• The student identifies the anatomical relationships of the endocrine glands and uses models or drawings to illustrate their location and function.</li> </ul>	<p><b>6</b></p>	<p><b>eleventh</b></p>
<p><b>Report</b></p>	<p>The lecture was presented via PowerPoint and discussed</p>	<p><b>Special senses</b></p>	<ul style="list-style-type: none"> <li>• The student learns the basic anatomical components of the special senses such as the eye, ear, nose, tongue, and skin.</li> <li>• The student explains the mechanism of action of each of the special senses and its role in receiving and processing sensory stimuli.</li> </ul>	<p><b>6</b></p>	<p><b>twelfth</b></p>

	with the .students		<ul style="list-style-type: none"> <li>• The student identifies the locations and parts of the sensory organs using anatomical models or drawings and explains their functional relationships.</li> </ul>		
discussion	The lecture was presented via PowerPoint and discussed with the .students	Urinary system	<ul style="list-style-type: none"> <li>• The student learns the main anatomical structures of the urinary system , including the kidneys, ureters, bladder, and urethra.</li> <li>• The student explains the function of the urinary system in filtering the blood, removing liquid waste from the body, and regulating fluid balance.</li> <li>• The student identifies the location of the urinary structures and their anatomical relationships using anatomical models or drawings.</li> </ul>	6	thirteenth
Daily exams	The lecture was presented via PowerPoint and discussed with the .students	Reproductive system	<ul style="list-style-type: none"> <li>• The student learns the main anatomical structures of the male and female reproductive systems , including the internal and external reproductive organs.</li> <li>• The student explains the physiological functions of the reproductive system such as gamete production, fertilization, and supporting embryonic growth.</li> <li>• The student identifies the locations and parts of the reproductive system using anatomical models or drawings and explains the anatomical relationships associated with them.</li> </ul>	6	fourteenth
Daily exams	The lecture was presented via	Gynecology, pregnancy, childbirth, Embryology, Childhood, growth and development	<ul style="list-style-type: none"> <li>• The student learns the basics of gynecology and obstetrics , including the functional anatomy of the female reproductive</li> </ul>	6	fifteenth

	<p><b>PowerPoint and discussed with the .students</b></p>		<p>system, and the stages of pregnancy and childbirth.</p> <ul style="list-style-type: none"> <li>• <b>The student explains the stages of fetal development from fertilization to birth</b> , in addition to the basic developments in childhood and child growth.</li> <li>• <b>The student describes the factors affecting the normal growth and development of the child</b> and identifies common health indicators and illnesses in different stages of childhood.</li> </ul>		
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### Course Evaluation .12

Daily exams, monthly and final theoretical and practical exams, classroom discussions, reports

### Learning and teaching resources .13

<p>ministerial portfolio</p>	<p><b>Required textbook (methodology)</b></p>	
<p><i>Drake RL (eds) (2019). Gray's Anatomy for Students. London: Elsevier.</i></p> <p>2. <i>Netter, F. (2019). Atlas of Human Anatomy (7th ed.). Philadelphia, PA: Saunders.</i></p>	<p><b>Main references (sources)</b></p>	
	<p><b>Recommended supporting books and references scientific journals, reports, ) (.etc</b></p>	
	<p><b>Electronic references, websites</b></p>	

<b>Course Name: Human Biology .1</b>
<b>Course Code .2</b>
<b>Term – Year : First Term / Second Term 2025-2026</b>
<b>Date the description was prepared 15/9/2025 .4</b>
<b>Available attendance methods/In-person .5</b>
<b>Total hours / Total units: Two hours for the theoretical .6 component hours for the practical component (270 hours over the two 7 (semesters units 4</b>
<b>Name of course coordinator (if more than one is required): .7 Name and university email address Name / Dr. Sami Najaf Bakhoor: For the theoretical aspect M.B. Huda Ahmed: For the practical side</b>
<b>Course Objectives (Subject Matter Objectives) .8 The student should be familiar with the basic concepts of the subject and its practical methods to increase the effectiveness and efficiency of laboratories in accordance with the objectives of the Department of Medical Laboratory .Technologies</b>
<b>Teaching and learning strategies .1 Interactive structured discussion - Practical statement -</b>

**Problem solving -**  
**Cooperative workshops -**

**Course structure (theoretical aspect) .10**

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Daily exams, discussion, and report	The lecture was presented via PowerPoint and discussed with the students	General introduction and ordinary microscope	<ul style="list-style-type: none"> <li>• The student learns the basic principles of laboratory and diagnostic sciences through a general introduction to the equipment and basic concepts used in the laboratory.</li> <li>• The student explains the parts of the Ordinary Light Microscope the function of , each part, and how it works to magnify samples.</li> <li>• The student applies practical skills in using the microscope , such as preparing slides, focusing, and identifying cellular structures under the microscope.</li> </ul>	6	the first
Daily exams, discussions, and reports	The lecture was presented via PowerPoint and discussed with the students	Classification microscopes	<ul style="list-style-type: none"> <li>• The student learns about the different types of microscopes , such as the light microscope (simple and compound), the fluorescence microscope, the transmission electron microscope and the scanning electron microscope, and classifies them according to their operating principle.</li> <li>• The student explains the features and uses of each type of microscope in the medical and research fields, clarifying the differences in analytical power and accuracy.</li> <li>• The student distinguishes between types of microscopes in terms of structure and application and chooses the</li> </ul>	6	the second

			appropriate microscope according to the nature of the sample and the purpose .of the examination		
<b>Daily exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint and discussed with the .students</b>	<b>Centrifuge</b>	<ul style="list-style-type: none"> <li>• <b>The student learns the operating principle of a centrifuge</b> and its basic parts, such as the rotor, the chamber, and the types of tubes used.</li> <li>• <b>The student explains the uses of a centrifuge</b> in separating the components of biological samples (such as blood, urine, or cellular fluids) based on density.</li> <li>• <b>The student applies the safety procedures and correct operation of the device</b> , such as balancing the pipes and adjusting the speed and duration, to ensure accurate and safe results.</li> </ul>	<b>6</b>	<b>the third</b>
<b>Daily exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint and discussed with the .students</b>	<b>General laboratory apparatus</b>	<ul style="list-style-type: none"> <li>◆ <b>The student distinguishes between general laboratory equipment and tools and uses them correctly according to their function in basic examinations.</b></li> </ul>	<b>6</b>	<b>Fourth</b>
<b>Daily exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint and</b>	<b>Balance</b>	<ul style="list-style-type: none"> <li>◆ <b>The student uses the laboratory balance accurately to weigh the chemical materials while adhering to safety and calibration procedures.</b></li> </ul>	<b>6</b>	<b>Fifth</b>

	discussed with the .students				
Daily exams, discussions, and reports	The lecture was presented via PowerPoint and discussed with the .students	Incubator	<ul style="list-style-type: none"> <li>◆ The student operates the laboratory incubator to adjust the appropriate temperature for the growth of microorganisms or the preservation of biological samples.</li> </ul>	6	Sixth
Daily exams, discussions, and reports	The lecture was presented via PowerPoint and discussed with the .students	Autoclave	<ul style="list-style-type: none"> <li>◆ The student operates the autoclave to sterilize laboratory instruments and materials using pressurized steam according to safety standards.</li> </ul>	6	Seventh
Daily exams, discussions, and reports	The lecture was presented via PowerPoint and discussed with the .students	PCR	<ul style="list-style-type: none"> <li>◆ The student explains the principle of operation of PCR technology and operates the device to prepare and amplify DNA in molecular diagnostics.</li> </ul>	6	Eighth

<b>Daily exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint and discussed with the students</b>	<b>Microtome</b>	<b>⇨ The student uses a microtome to cut thin slices of biological samples in preparation for microscopic examination accurately and safely.</b>	<b>6</b>	<b>Ninth</b>
<b>Daily exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint and discussed with the students</b>	<b>Autoclave, sterilization methods and mechanism Principle &amp; Applications Care and safety</b>	<b>⇨ The student explains the operating principle of the autoclave and the mechanism of sterilization with pressurized steam, and applies different sterilization methods in the laboratory, explaining their practical uses.</b>	<b>6</b>	<b>tenth</b>
<b>Daily exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint and discussed with the students</b>	<b>Electrophoresis apparatus Principles &amp; Uses Care and safety</b>	<b>⇨ The student explains the operating principle of the electrophoresis device and uses it to separate and analyze biological molecules, while adhering to the procedures for care and safety during operation.</b>	<b>6</b>	<b>eleventh</b>
<b>Daily exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint and</b>	<b>PCR components, types and Principle &amp; Uses Care and safety</b>	<b>⇨ The student learns about the components of the PCR device and technology its different , types, and explains its working principle and uses in molecular diagnosis, while adhering to care and</b>	<b>6</b>	<b>twelfth</b>

	discussed with the students		safety procedures during work.		
Daily exams, discussions, and reports	The lecture was presented via PowerPoint and discussed with the students	Microtome Principle & Uses Care and safety	Microtome Principle & Uses Care and safety	6	thirteenth
Daily exams, discussions, and reports	The lecture was presented via PowerPoint and discussed with the students	Photometer & Spectrometer Parts & Principle, Uses	◆ The student learns the parts of the photometer and spectrometer, explains their operating principle, and uses them to measure light absorption and analyze samples in the laboratory.	6	fourteenth
Daily exams, discussions, and reports	The lecture was presented via PowerPoint and discussed with the students	Spectrophotometer Parts & principle Setup & Calibration	◆ The student explains the parts of the spectrophotometer and its operating principle, and applies the steps of its preparation and calibration accurately to ensure the accuracy of laboratory measurements.	6	fifteenth

## Learning and teaching resources .12

### Required textbooks (methodology, if applicable)

1-Braybrook, Julian H. "Biocompatibility: Assessment of Medical Devices and Materials." *Biocompatibility: Assessment of Medical Devices and Materials*, by Julian H. Braybrook (Editor), ISBN 0-471-96597-9. Wiley-VCH, December 1996. (1996): 246.

2-Ninfa, Alexander; Ballou, David; Benore, Marilee (2009). *Fundamental Laboratory Approaches for Biochemistry and Biotechnology*. United Kingdom:

Webster, John. *Medical instrumentation: application and design*. John Wiley & Sons, 2009.

### Main references (sources)

	<b>Electronic references and websites</b>
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<b>Course Evaluation .11</b>
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**The grade out of 100 is distributed according to the tasks assigned to the student, such as daily preparation, daily oral and written exams, .reports, etc**

**The practical exam is worth 15 marks, and the daily exam is worth 15 marks, distributed between attendance, daily exams, and reports. These .are combined and divided to form the final grade out of 15 marks**

## **Course structure (practical aspect)**

<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
<b>Theoretical tests</b>	<b>theoretical</b>	<b>The Science of Biology  Why study biology is important, Definition of biology, Some subdivision of biology</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>the first</b>
<b>Theoretical tests</b>	<b>theoretical</b>	<b>The Characteristics of Living )Organisms)  Evaluation, Adaptation, Respiration,</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>the second</b>
<b>Theoretical tests</b>	<b>theoretical</b>	<b>The Kingdom of Living Things Classification of Organisms, Categories of Classification of Organisms, The five Kingdom Scheme Of</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>the third</b>

		<b>Classification</b>			
<b>Theoretical tests</b>	<b>theoretical</b>	<b>Chemistry of Life (Biology of Polymers, Levels of Organization  Lipids, Carbohydrates, proteins, amino acids</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>Fourth</b>
<b>Theoretical tests</b>	<b>theoretical</b>	<b>Cell Structure and Function, Animal cells  Cell Wall, Cell Membrane, Cytoplasmic Matrix, Nucleolus</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>Fifth</b>
<b>Theoretical tests</b>	<b>theoretical</b>	<b>Endoplasmic Reticulum, Golgi apparatus, Cilia, Flagella Plant cells Comparison Between</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>Sixth</b>

		<b>Animal and Plant, etc.</b>			
<b>Theoretical tests</b>	<b>theoretical</b>	<b>Prokaryotes Cells, Eukaryotes Cells, Differences, Characteristics and Comparison</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>Seventh</b>
<b>Theoretical tests</b>	<b>theoretical</b>	<b>Cell Life Cycle (Mitosis), Nucleus Division, Cytoplasmic Division)</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>Eighth</b>
<b>Theoretical tests</b>	<b>theoretical</b>	<b>Meiosis (Human Reproduction), Spermatogenesis, Oogenesis</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>Ninth</b>
<b>Theoretical tests</b>	<b>theoretical</b>	<b>Gene and Gene Action, DNA, RNA Structures.</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>tenth</b>
<b>Theoretical tests</b>	<b>theoretical</b>	<b>Genetic Codes, Replication,</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>eleventh</b>

		<b>Translation, Transcription, Mutation</b>			
<b>Theoretical tests</b>	<b>theoretical</b>	<b>Organ Systems (Digestive, Circulatory, Respiratory, Urinary, Muscularly, Nervous Systems</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>twelfth</b>
<b>Theoretical tests</b>	<b>theoretical</b>	<b>Viruses, Viroid's, Prions, Bacteriophages, Virtual Life Cycle, Characteristics, Shapes</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>thirteenth</b>
<b>Theoretical tests</b>	<b>theoretical</b>	<b>Viral Human Diseases, Harm full of Viruses</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>fourteenth</b>
<b>Theoretical tests</b>	<b>theoretical</b>	<b>Kingdom OF Moneta: Phylum Schizothyme (Bacteria), Classification Structure,</b>	<b>Study, knowledge, and practical application</b>	<b>2</b>	<b>fifteenth</b>

		<b>Morphology.</b> ,			
		<b>Growth and Function, Motility</b>			

<b>Tests practical</b>	<b>practical</b>	<b>Cell Structure and Function, Animal cells  Cell Wall, Cell Membrane, Cytoplasmic Matrix, Nucleolus</b>	<b>Study, knowledge, and practical application</b>	<b>7</b>	<b>Fifth</b>
<b>Tests practical</b>	<b>practical</b>	<b>Endoplasmic Reticulum, Golgi apparatus, Cilia, Flagella Plant cells Comparison Between Animal and Plant, etc.</b>	<b>Study, knowledge, and practical application</b>	<b>7</b>	<b>Sixth</b>
<b>Tests practical</b>	<b>practical</b>	<b>Prokaryotes Cells, Eukaryotes Cells, Differences, Characteristics and Comparison</b>	<b>Study, knowledge, and practical application</b>	<b>7</b>	<b>Seventh</b>
<b>Tests practical</b>	<b>practical</b>	<b>Cell Life Cycle (Mitosis), Nucleus Division, Cytoplasmic Division)</b>	<b>Study, knowledge, and practical application</b>	<b>7</b>	<b>Eighth</b>
<b>Practical tests</b>	<b>Look practical</b>	<b>Meiosis (Human Reproduction), Spermatogenesis, Oogenesis</b>	<b>Study, knowledge, and practical application</b>	<b>7</b>	<b>Ninth</b>

<b>Tests practical</b>	<b>practical</b>	<b>Gene and Gene Action, DNA, RNA Structures.</b>	<b>Study, knowledge, and practical application</b>	<b>7</b>	<b>tenth</b>
<b>Tests practical</b>	<b>practical</b>	<b>Genetic Codes, Replication, Translation, Transcription, Mutation</b>	<b>Study, knowledge, and practical application</b>	<b>7</b>	<b>eleventh</b>
<b>Tests practical</b>	<b>practical</b>	<b>Organ Systems (Digestive, Circulatory, Respiratory, Urinary, Muscularly, Nervous Systems</b>	<b>Study, knowledge, and practical application</b>	<b>7</b>	<b>twelfth</b>
<b>Tests practical</b>	<b>practical</b>	<b>Viruses, Viroid's, Prions, Bacteriophages, Virtual Life Cycle, Characteristics, Shapes</b>	<b>Study, knowledge, and practical application</b>	<b>7</b>	<b>thirteenth</b>
<b>Tests practical</b>	<b>practical</b>	<b>Viral Human Diseases, Harm full of Viruses</b>	<b>Study, knowledge, and practical application</b>	<b>7</b>	<b>fourteenth</b>
<b>Tests practical</b>	<b>practical</b>	<b>Kingdom of Monera: Phylum Schizophyte (Bacteria), Classification Structure , Morphology.,</b>	<b>Study, knowledge, and practical application</b>	<b>7</b>	<b>fifteenth</b>

		<b>Growth and Function, Motility</b>			
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**Course Evaluation .10**

**The grade out of 100 is distributed according to the tasks assigned to the student, such as daily preparation, daily oral and written exams, reports, .etc**

**The practical grade is a full 15**

**.The theoretical grade is 25**

**The final is out of 60**

**Learning and teaching resources .2**

	<b>Required textbooks (methodology, if applicable)</b>
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<b>Biology 25: Human Biology: Prof. Gonsalves Los  Angeles City College Loosely Based on Mader's  Human Biology</b>	<b>Main references (sources)</b>
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	<b>Electronic references and websites</b>
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## Headquarters description form

<b>Course Name .1</b>
Computer Application
<b>Course Code .2</b>
<b>Term/Year .3</b>
Chapter One – Chapter Two 2026-2025
<b>Date the description was prepared .4</b>
2025/9/15
<b>Available forms of attendance .5</b>
In-person lectures
<b>Number of hours (total) / Number of units (total) .6</b>
Two hours for the theoretical aspect / 6 hours for the practical aspect (240 hours during the year)
<b>Name of course coordinator (if more than one is required): .7</b>
<b>Name and university email address</b>
Dr. Mazen Riyad Mansour <a href="mailto:mazin-r.al-hameed@nust.edu.iq">mazin-r.al-hameed@nust.edu.iq</a> M.M. Amin Hamid Sakhi alsalhyamyn21@gmail.com
<b>Course Objectives (Subject Matter Objectives) .8</b>

**This course aims to:**

- 1. To provide students with the basic skills to use computer applications in academic and professional fields.**
- 2. Developing a comprehensive understanding of operating systems and productivity software such as word processors, spreadsheets, and presentations.**
- 3. Teaching students the basics of the internet, email, and information security.**
- 4. Enhance online research and data analysis skills using digital tools.**
- 5. Enabling students to use specialized software in the field of medical and health technologies**

### **Teaching and learning strategies .1**

- . Theoretical lectures and practical applications in laboratories •**
- . Interactive learning via digital platforms •**
- . Presentations and practical projects •**
- . Practical exercises and problem-solving •**

<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
Short test	Theoretical and practical lecture	Introduction to Computers and Operating Systems	Understanding basic computer concepts	<b>2</b>	<b>the first</b>
Practical exercise	Lecture and laboratory	Introduction to operating systems (Windows, Linux)	Understanding the operating systems environment	<b>2</b>	<b>the second</b>
mini project	practical application	Microsoft Word basics	Using word processors	<b>2</b>	<b>the third</b>
Practical exercise	practical application	Microsoft Excel basics	Using electronic spreadsheets	<b>2</b>	<b>Fourth</b>
presentation	Lecture and practical work	Microsoft PowerPoint Basics	Creating presentations	<b>2</b>	<b>Fifth</b>
Practical exercise	Practical lecture	Search and email tools	Online search and email management	<b>2</b>	<b>Sixth</b>
a test	Discussion and practical application	Digital security concepts	Understanding cybersecurity and data protection	<b>2</b>	<b>Seventh</b>

Practical exercise	practical application	Data analysis using Excel/SPSS	graphical analysis using software	2	<b>Eighth</b>
project	practical lecture	Software used in medical and health technologies	Understanding computer applications in the health field	2	<b>Ninth</b>
practical control	Lecture and practical application	Introduction to Programming using Python	Basic programming training	2	<b>tenth</b>
group exercise	practical application	Use Google Drive and Teams	Collaborative work and project management	2	<b>eleventh</b>
presentation	workshop	Advanced PowerPoint techniques	Developing professional presentations	2	<b>twelfth</b>
Achievement test	interactive	Comprehensive course review	Evaluating student performance and reviewing content	2	<b>thirteenth</b>
Project evaluation	Project submission	Final applied project	Final practical application	2	<b>fourteenth</b>

Final assessment	Open discussion	Conclusions and Recommendations	Comprehensive discussion and evaluation	<b>2</b>	<b>fifteenth</b>
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Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
<p>- Written exams</p> <p>oral exam, assessment of students' application of each subject</p>	<p>Applying lectures with students and discussing them with students</p>	<p>Introduction to Microsoft Word</p>	<p>Familiarize * yourself with the program interface and its basic .components</p> <p>Differentiating * between the different toolbars Home, Insert, ) .(.Layout, etc</p> <p>Knowing the * function of each button and tool .within the interface</p> <p>Understanding * the program structure: title bar, menu bar, status bar, ruler, .workspace</p> <p>The ability to * open, save, and edit a new document in .basic terms</p>	<p>6</p>	<p>the first</p>
<p>Written exams</p> <p>oral exam, assessment of students' application of each subject</p>	<p>Applying lectures with students and discussing them with students</p>	<p>Main bar</p>	<p>Save documents * .in different formats</p> <p>Editing the text * font, size, color, ) .(style</p> <p>Paragraph * formatting alignment, ) spacing, bullet points and .(numbering</p> <p>Execute copy, cut, * and paste .commands</p>	<p>6</p>	<p>the second</p>

			Printing and preparing the page .for printing *		
Written exams oral exam, assessment of students' application of each subject	Applying lectures with students and discussing them with students	Drawer bar	Save documents * .in different formats  Editing the text * (font, size, color, ) .(style  Paragraph * formatting alignment, ) spacing, bullet points and .(numbering  Execute copy, cut, * and paste .commands  Printing and preparing the page .for printing	6	the third
Written exams oral exam, assessment of students' application of each subject	Applying lectures with students and discussing them with students	Layout bar	Change the paper * orientation .(vertical/horizontal)  Adjusting page .margins  Choose the * appropriate paper .size for printing  Preparing the * page for display or printing according to specific .requirements	6	Fourth
Written exams oral exam, assessment of students' application of each subject	Applying lectures with students and discussing them with students	Reference bar	.Add footnotes  Include * quotations and .sources  Automatically * generates the .reference list	6	Fifth

			Inserting * automatic indexes .and headings		
Written exams  oral exam, assessment of students' application of each subject	Applying lectures with students and discussing them with students	Preview bar	Preview the * document before .printing  Spelling and * grammar checking .of texts  Using translation * .tools  Add comments * and feedback for .review	6	Sixth
Written exams  oral exam, assessment of students' application of each subject	Applying lectures with students and discussing them with students	Display bar	Switching * between different display modes print layout, ) . (reading, etc  Use the zoom * .in/out tool  Hide or show tools * such as the ruler .and layout grid	6	Seventh
Written exams  oral exam, assessment of students' application of each subject	Applying lectures with students and discussing them with students	Drawer bar	Use the ribbon to * insert mathematical .equations  Include graphs * and explanatory .data  Insert tables, * images, and .interactive elements  Learn about the * different insertion tools and apply them practically in .the document	6	Eighth
Written exams	Applying lectures with	Make a folder	The learner * should be able to	6	Ninth

<p>oral exam, assessment of students' application of each subject</p>	<p>students and discussing them with students</p>		<p>distinguish between .files and folders</p> <p>To create a new * .folder and name it</p> <p>To move or copy * .a file to a folder</p> <p>To rename a file * .or folder</p> <p>To delete a folder * using the appropriate .commands</p> <p>Use the "View" * toolbar to change how files are .displayed</p>		
<p>Written exams</p> <p>oral exam, assessment of students' application of each subj Written exams</p> <p>oral exam, assessment of students' application of each subject ect</p>	<p>Applying lectures with students and discussing them with students</p>	<p>Introduction to PowerPoint</p>	<p>The learner * should become familiar with the components of the PowerPoint program interface ( ribbon, slide panel, .(...status bar</p> <p>To open a new * .presentation</p> <p>To create a new * segment within the .presentation</p> <p>To distinguish * between the main .tabs in the ribbon</p> <p>To use basic menus such as (File, Insert, .Design) as required</p>	<p>6</p>	<p>tenth</p>
<p>Written exams</p> <p>oral exam, assessment of students' application of each subject</p>	<p>Applying lectures with students and</p>	<p>Main Tape</p>	<p>To use the cut, copy and paste commands for texts .and elements</p>	<p>6</p>	<p>eleventh</p>

	discussing them with students		<p>To format the * texts (color, size, .font type</p> <p>The use of bullet * points or .numbering on texts</p> <p>To insert a new * slide and rearrange .it</p> <p>To change the * alignment of the .text within the slide</p> <p>To use "editing" * tools such as find or .replace</p>		
Written exams oral exam, assessment of students' application of each subject	Applying lectures with students and discussing them with students	Design bar	<p>To choose a ready- * ) made design theme) for the .presentation</p> <p>To adjust the * colors and fonts to match the content .of the presentation</p> <p>To change the * background of the .slide</p> <p>The formatting * can be applied to all slides or to a .specific slide</p> <p>To employ a * design appropriate to the subject of the .presentation</p>	6	twelfth
Written exams oral exam, assessment of students' application of each subject	Applying lectures with students and discussing them with students	Slideshow transition bar	<p>To distinguish between Transitions and Animations.</p> <p>To apply a transition effect</p>	6	thirteenth

			<p>between two or .more slices</p> <p>To specify the duration of the .transfer</p> <p>To display the slides with a .transition preview</p> <p>To specify the timing of the transition (manual .(or automatic click</p>		
<p>Written exams</p> <p>oral exam, assessment of students' application of each subject</p>	<p>Applying lectures with students and discussing them with students</p>	<p>Design bar</p>	<p>Use the ribbon to insert mathematical .equations</p> <p>Include graphs and .explanatory data</p> <p>Insert tables, images, and .interactive elements</p> <p>Learn about the different insertion tools and apply them practically in .the document</p>	<p>6</p>	<p>fourteenth</p>
<p>Written exams</p> <p>oral exam, assessment of students' application of each subject</p>	<p>Applying lectures with students and discussing them with students</p>	<p>Transition ber</p>	<p>Add video and audio clips; and view and preview .slides</p>	<p>6</p>	<p>fifteenth</p>
<p>Written exams</p> <p>oral exam, assessment of students' application of each subject</p>	<p>Applying lectures with students and discussing them with students</p>	<p>Display bar</p>	<p>Familiarize * yourself with the program interface and its basic .components</p> <p>Differentiating * between the different toolbars Home, Insert, ) .(.Layout, etc</p>	<p>6</p>	<p>Sixteenth</p>

			<p><b>Knowing the * function of each button and tool .within the interface</b></p> <p><b>Understanding * the program structure: title bar, menu bar, status bar, ruler, .workspace</b></p> <p><b>The ability to * open, save, and edit a new document in .basic terms</b></p>		
<p><b>Written exams</b>  oral exam, assessment of students' application of each subject</p>	<p><b>Applying lectures with students and discussing them with students</b></p>	<p><b>Preview bar</b></p>	<p><b>Save documents * .in different formats</b></p> <p><b>Editing the text * font, size, color, ) (.style</b></p> <p><b>Paragraph * formatting alignment, ) spacing, bullet points and (.numbering</b></p> <p><b>Execute copy, cut, * and paste .commands</b></p> <p><b>Printing and * preparing the page .for printing</b></p>	<p><b>6</b></p>	<p><b>seventeenth</b></p>
<p><b>Written exams</b>  oral exam, assessment of students' application of each subject</p>	<p><b>Applying lectures with students and discussing them with students</b></p>	<p><b>Main bar</b></p>	<p><b>Save documents * .in different formats</b></p> <p><b>Editing the text * font, size, color, ) (.style</b></p> <p><b>Paragraph * formatting alignment, ) spacing, bullet</b></p>	<p><b>6</b></p>	<p><b>eighteenth</b></p>

			<p>points and .numbering</p> <p>Execute copy, cut, * and paste .commands</p> <p>Printing and preparing the page .for printing</p>		
<p>Written exams</p> <p>oral exam, assessment of students' application of each subject</p>	<p>Applying lectures with students and discussing them with students</p>	<p>Layout bar</p>	<p>Change the paper * orientation .vertical/horizontal)</p> <p>Adjusting page .margins</p> <p>Choose the * appropriate paper .size for printing</p> <p>Preparing the * page for display or printing according to specific .requirements</p>	<p>6</p>	<p>nineteenth</p>
<p>Written exams</p> <p>oral exam, assessment of students' application of each subject</p>	<p>Applying lectures with students and discussing them with students</p>	<p>Drawer bar</p>	<p>.Add footnotes</p> <p>Include * quotations and .sources</p> <p>Automatically * generates the .reference list</p> <p>Inserting * automatic indexes .and headings</p>	<p>6</p>	<p>Twenty</p>
<p>Written exams</p> <p>oral exam, assessment of students' application of each subject</p>	<p>Applying lectures with students and discussing them with students</p>	<p>Make a folder</p>	<p>Preview the * document before .printing</p> <p>Spelling and * grammar checking .of texts</p> <p>Using translation * .tools</p>	<p>6</p>	<p>Twenty-one</p>

			Add comments * and feedback for .review		
Written exams  oral exam, assessment of students' application of each subject	Applying lectures with students and discussing them with students	Introduction to PowerPoint	Switching * between different display modes print layout, ) . (reading, etc  Use the zoom * .in/out tool  Hide or show tools * such as the ruler .and layout grid	6	Twenty- second
Written exams  oral exam, assessment of students' application of each subject	Applying lectures with students and discussing them with students	Reference bar	Use the ribbon to * insert mathematical .equations  Include graphs * and explanatory .data  Insert tables, * images, and .interactive elements  Learn about the * different insertion tools and apply them practically in .the document	6	Twenty- third
Written exams  oral exam, assessment of students' application of each subject	Applying lectures with students and discussing them with students	Preview bar	The learner * should be able to distinguish between .files and folders  To create a new * .folder and name it  To move or copy * .a file to a folder  To rename a file * .or folder  To delete a folder * using the	6	Twenty- fourth

			<p>appropriate .commands</p> <p>Use the "View" * toolbar to change how files are .displayed</p>		
<p>Written exams</p> <p>oral exam, assessment of students' application of each subject</p>	<p>Applying lectures with students and discussing them with students</p>	<p>Display bar</p>	<p>The learner * should become familiar with the components of the PowerPoint program interface ( ribbon, slide panel, .(...status bar</p> <p>To open a new * .presentation</p> <p>To create a new * segment within the .presentation</p> <p>To distinguish * between the main .tabs in the ribbon</p> <p>To use basic menus such as (File, Insert, .Design) as required</p>	<p>6</p>	<p>Twenty-fifth</p>
<p>Written exams</p> <p>oral exam, assessment of students' application of each subject</p>	<p>Applying lectures with students and discussing them with students</p>	<p>Slideshow transition bar</p>	<p>To use the cut, copy and paste commands for texts .and elements</p> <p>To format the * texts (color, size, .(font type</p> <p>The use of bullet * points or .numbering on texts</p> <p>To insert a new * slide and rearrange .it</p>	<p>6</p>	<p>Twenty-sixth</p>

			<p>To change the * alignment of the .text within the slide</p> <p>To use "editing" * tools such as find or .replace</p>		
<p>Written exams</p> <p>oral exam, assessment of students' application of each subject</p>	<p>Applying lectures with students and discussing them with students</p>	<p>Main Tape</p>	<p>To choose a ready- * ) made design theme) for the .presentation</p> <p>To adjust the * colors and fonts to match the content .of the presentation</p> <p>To change the * background of the .slide</p> <p>The formatting * can be applied to all slides or to a .specific slide</p> <p>To employ a * design appropriate to the subject of the .presentation</p>	<p>6</p>	<p>Twenty-seventh</p>
<p>Written exams</p> <p>oral exam, assessment of students' application of each subject</p>	<p>Applying lectures with students and discussing them with students</p>	<p>Design bar</p>	<p>To distinguish between Transitionsand Animations.</p> <p>To apply a transition effect between two or .more slices</p> <p>To specify the duration of the .transfer</p> <p>To display the slides with a .transition preview</p>	<p>6</p>	<p>Twenty-eighth</p>

			To specify the timing of the transition (manual .(or automatic click		
Written exams oral exam, assessment of students' application of each subject	Applying lectures with students and discussing them with students	Transition ber	Use the ribbon to insert mathematical .equations  Include graphs and .explanatory data  Insert tables, images, and .interactive elements  Learn about the different insertion tools and apply them practically in .the document	6	Twenty-ninth
Written exams oral exam, assessment of students' application of each subject	Applying lectures with students and discussing them with students	Display bar	Add video and audio clips; and view and preview .slides	6	thirty

### **Course Evaluation .11**

**The grade out of 100 is distributed according to the tasks assigned to the student, such as daily preparation, daily oral .and written exams, reports, etc**

**The grade out of 100 is distributed according to the following tasks:**

- **Daily preparation and participation: 10%**
- **Short and oral exams: 20%**
- **Reports and practical projects: 30%**
- **Final exam: 40%**

### **Learning and teaching resources .12**

<b>Computer applications, ministerial portfolio</b> Introduction to Computer Science Microsoft Office for Beginners	<b>Required textbooks (methodology, if applicable)</b>
	<b>Main references (sources)</b>
Microsoft Office Tutorials: <a href="https://www.microsoft.com/en-us/training">https://www.microsoft.com/en-us/training</a> FreeCodeCamp: <a href="https://www.freecodecamp.org">https://www.freecodecamp.org</a> Coursera – Computer Basics: <a href="https://www.coursera.org">https://www.coursera.org</a>	<b>Electronic references and websites</b>

**Course Name: Human Rights .1**

**: Course code .2**

**Term /Year : 2025-2026**

**Date this description was prepared : 15/9/2025 .4**

**Available attendance methods : In person .5**

**hours / 2 unit hours2 : Total study hours / Total unit hours .6**

**: Name of the course coordinator (if there is more than one, please state) .7**

M.M. Abdul Khaliq Shahd Thamer

M.M. Hawraa Awda

**Course Objectives .8**

human rights

**Course Objectives**

provide a general overview of human rights inherent in human nature, and to .1  
.highlight the importance of these rights and how to preserve and protect them  
ning the student on the importance of participating in different aspects of life, .2  
.such as promoting respect for human rights principles  
Active participation in various aspects of life  
ognizing human rights contributes to achieving justice and equality within .3  
society, as  
.Student-led education is a platform for this  
tying human rights leads to the enhancement and development of student .4  
.behavior, which in turn contributes to a decrease in conflicts and disputes  
tying human rights leads to understanding those rights in the Iraqi constitution .5  
.and the constitutions of other countries, and becoming familiar with them  
On organizations and agreements that promote those rights  
Ba'ath Party crimes  
amiliarize the student with the crimes committed by that defunct regime and .1  
their brutality  
erstanding the extent of the economic losses he contributed to, such as the .2  
.international embargo that lasted for many years  
The system that is not a system, in addition to the wars in which it participated  
erstanding the psychological and physical losses inflicted by this regime on .3  
.all segments of Iraqi society

<p>familiarize the student with the brutality of the former regime in order to .4          .prevent its recurrence in the future by selecting suitable individuals          .The qualified candidates should undergo a detailed study before being selected          give a brief overview of a horrific period that Iraq went through for .5          .approximately 33 years, during which the people suffered greatly          .It has material and moral consequences and many losses of life</p>	
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### : Learning and teaching strategies .9

The education in this program includes theoretical instruction that focuses on .4  
 studying scientific problems in a purely scientific manner, aiming to understand  
 .the root of the problem and to find solutions for it  
 Learning depends on cooperation between the student and the teacher to .5  
 understand the lesson as much as possible and to overcome the obstacles that  
 .hinder the student's understanding  
 Students were urged to use books and scientific articles, whether physical or .6  
 electronic, as they greatly help in retaining information and allow for discussion  
 .and conclusions

### Course Structure .10

Evaluation Method	Learning method	Required scientific outputs	Unit or topic name	Hours	Week
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student knows what human rights are and their importance in protecting human . dignity</b>	Understanding what human rights are	2	the first
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The • student explains the</b>	Human rights, charters and agreements International	2	the second

		<b>international conventions and agreements related to human rights and their role in promoting them</b>			
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<b>The student learns about the human rights stipulated in the Iraqi constitution and their legal implications</b>	Human rights and the Iraqi constitution	2	the third
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<b>The student distinguishes between actions that are considered basic human rights</b>	Works that are considered rights man	2	Fourth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<b>The student describes the methods and approaches used to protect human rights at the local and international levels</b>	How to protect human rights	2	Fifth
Exams and discussions	The lecture was presented via PowerPoint and	<b>The student learns</b>	human rights organizations	2	Sixth

	discussed with the .students	<b>about human rights organizations and their role in monitoring and protecting . rights</b>			
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student learns the definition of equality as a fundamental principle of human . rights</b>	Definition of equality	2	Seventh
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student explains the concept of equality in Islam and how it is compatible with the principles of . human rights</b>	Equality in Islam	2	Eighth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student explains the concept of equality in the United Nations system and its role in protecting human rights . globally</b>	Equality in the United Nations	2	Ninth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	The student understands the concept of gender equality and its importance in achieving . social justice	Gender equality	2	tenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	The student knows what democracy is as a political principle that guarantees the participation of the people in . government	Democracy	2	eleventh

Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	The student distinguishes between the different types and various forms of democracy	?What is democracy	2	twelfth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	The student explains the characteristics of direct democracy and how it is applied in some political systems	Types of Democracy	2	thirteenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	The student explains the concept of representative democracy and the mechanism of representing the people through it in decision-making	Direct democracy	2	fourteenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	The student explains the concept of representative democracy and the mechanism of representing the people through it in decision-making	Representative democracy	2	fifteenth

### Course Evaluation .11

.Daily exams, monthly and final theoretical and practical exams, and classroom discussions

### Learning and teaching resources .12

Educational curriculum	<b>Required textbooks (methodology)</b>	
Universal Declaration of Human Rights, United Nations General Assembly, 10 December 1948	<b>Main references (sources)</b>	
Koran The Sajjadiyya Newspaper The Iraqi Constitution of 2005	<b>Recommended supporting books and references (scientific (journals, reports, etc</b>	
	<b>Electronic references, websites</b>	

**Arabic Language :Course Name .1**

**: Course code .2**

**Term / Year : Second Term 2025-2026**

**Date this description was prepared : 15/9/2025 .4**

**Available attendance methods : In person .5**

**Total study hours / Total unit hours : 2 hours / 2 unit hours .6**

**: Name of the course coordinator (if there is more than one, please state) .7**

M.M. Mansour Jaber Faleh

**Course Objectives .8**

**Course Objectives**

Arabic  
purpose of studying Arabic is for the student to develop a love for the Arabic .1  
.language, which is the language of the Quran  
to recognize its beauty, as it is considered one of the most important features of  
.the Arab-Islamic personality  
aim of the study is to learn some basic rules that form the basis of each .2  
.department in universities  
.These are basic rules for every university student  
student's mastery of Arabic sentence structure and increasing their .3  
.vocabulary, with a focus on developing skills  
The critic  
ing acquainted with some Arab poets and understanding their poetic imagery, .4  
.which is fundamental to Arab culture

**: Learning and teaching strategies .9**

The education in this program includes theoretical instruction that focuses on .7  
studying scientific problems in a purely scientific manner, aiming to understand  
.the root of the problem and to find solutions for it

Learning depends on cooperation between the student and the teacher to .8 understand the lesson as much as possible and to overcome the obstacles that .hinder the student's understanding

Students were urged to use books and scientific articles, whether physical or .9 electronic, as they greatly help in retaining information and allow for discussion .and conclusions

### Course structure (theoretical part) .10

Evaluation Method	Learning method	Learning outcomes	Unit or topic name	Hours	Week
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student knows the • original grammatical markers in the Arabic . sentence and their uses</b>	Original diacritical marks	2	Arabic the first
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student distinguishes • between the verbal sentence, the subject and its substitute, explaining their . grammatical functions</b>  <b>In the formation of a . nominal sentence</b>	The verbal sentence, the subject, and its substitute	2	the second
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student explains the • use of "kana" and its sisters and their effect on the grammatical analysis in the . sentence</b>	"Kana and its sisters"	2	the third
Exams and discussions	The lecture was presented via PowerPoint and discussed	<b>The student explains the • rules and regulations of the present tense verb in the . Arabic language</b>	present tense verb	2	Fourth

	with the .students				
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student distinguishes • in terms ظ and ض between of pronunciation, writing, . and usage</b> • •	and the ظ and ض The letters difference between them	2	Fifth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student analyzes examples of pre-Islamic poetry and studies its . themes and style</b> •	pre-Islamic Poetry: A Study and Analysis	2	Sixth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student learns about the life and poetry of Imru' al-Qais and Antarah ibn Shaddad and their role in . Arab heritage</b> •	Imru' al-Qais and Antarah ibn Shaddad	2	Seventh
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student reads Surah Al-Kahf and interprets its rhetorical and educational . contents</b> •	Surah Al-Kahf	2	Eighth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student analyzes selected examples of ancient . and modern Arabic poetry</b> •	Poetry examples		Ninth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student learns the characteristics of Islamic poetry and its role in expressing religious and . social values</b> •	Islamic poetry		tenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student learns the • characteristics of Arabic poetry and its linguistic and rhetorical features . throughout different eras</b> •	Arabic poetry		eleventh
Exams and discussions	The lecture was presented via PowerPoint and discussed	<b>The student explains the use of "inna" and its sisters and their effect on sentence</b>	Inna and its sisters		twelfth

	with the .students	<b>structure and grammatical . analysis</b>			
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student explains the • rules of the past tense and its uses in the Arabic . language</b>	past tense		thirteenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student distinguishes the hamza, its types, and the rules for . writing it</b>	The hamza		fourteenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>The student .1 identifies the subject and predicate and their role in forming . a nominal sentence</b>	Subject and predicate		fifteenth

### Course Evaluation .12

.Daily exams, monthly and final theoretical and practical exams, and classroom discussions

### Learning and teaching resources .13

Educational curriculum	<b>quired textbooks (methodology)</b>
	<b>Main references (sources)</b>
	<b>Recommended supporting books and references (scientific (.journals, reports, etc</b>
	<b>ctronic references, websites</b>





<b>Course Name .1</b>	<b>General Chemistry</b>
<b>Course Code .2</b>	
<b>Term/Year .3</b>	6 202 - 5 202
<b>Date the description was prepared .4</b>	2025/9/15
<b>Available forms of attendance .5</b>	<b>My presence in the laboratory and classrooms</b>
<b>Number of hours (total) / Number of units (total) .6</b>	<b>Two hours for the theoretical part / 8 hours for the practical part units 4</b>
<b>Name of course coordinator (if more than one is required): .7</b>	
<b>Name and university email address</b>	<b>M.M. akrmly856@gmail.com M.M. Akram Ali Saadoun <a href="mailto:horahora9392@gmail.com">horahora9392@gmail.com</a> Hawraa Basem Mohammed</b>
<b>Course objectives (subject matter objectives): The student will .8</b>	
<b>.become familiar with the chemistry laboratory in general terms</b>	
<b><u>General objective</u> : - To learn how to conduct organic chemical</b>	
<b>.reactions and prepare standard solutions and concentrations</b>	
<b><u>Specific Objective</u> : - The student will learn how to work in the</b>	
<b>handling chemicals, and avoid laboratory, take precautions and</b>	
<b>.how to use laboratory equipment and prepare solutions</b>	
<b>Teaching and learning strategies .9</b>	
	<b>Educational laboratories Conducting scientific studies Scientific research to serve society Explanatory and informative videos</b>
<b>Course structure (theoretical part) .10</b>	

<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
<b>Tests and reports</b>	<b>theoretical</b>	<b>Introduction to Chemistry, its importance, and general guidelines: General principles of element precipitation</b>	<b>Acquiring basic knowledge of chemistry and developing scientific skills to conduct experiments</b>	<b>2</b>	<b>the first</b>
<b>Tests and reports</b>	<b>theoretical</b>	<b>Water and Life / Chapter Elements of :1 Group 1</b>	<b>The ability to describe the water cycle in nature</b>	<b>2</b>	<b>the second</b>
<b>Tests and reports</b>	<b>theoretical</b>	<b>Solutions and their classification</b>	<b>This includes understanding the nature of solutions and how to classify them, such as the state of matter and solute .concentration</b>	<b>2</b>	<b>the third</b>
<b>Tests and reports</b>	<b>theoretical</b>	<b>Preparation of solutions of all kinds</b>	<b>The ability to prepare standard and dilute solutions and determine their concentrations</b>	<b>2</b>	<b>Fourth</b>
<b>Tests and reports</b>	<b>theoretical</b>	<b>Methods for calculating concentrations</b>	<b>Calculating the concentrations of reactants and products</b>	<b>2</b>	<b>Fifth</b>
<b>Tests</b>	<b>theoretical</b>	<b>Continued methods for</b>	<b>Calculating the</b>	<b>2</b>	<b>Sixth</b>

<b>and reports</b>		<b>calculating concentrations</b>	<b>concentrations of reactants and products</b>		
<b>Tests and reports</b>	<b>theoretical</b>	<b>Solubility, Part 1</b>	The ability to link its solubility to chemical processes	<b>2</b>	<b>Seventh</b>
<b>Tests and reports</b>	<b>theoretical</b>	<b>Solubility, Part Two</b>	The ability to link its solubility to chemical processes	<b>2</b>	<b>Eighth</b>
<b>Tests and reports</b>	<b>theoretical</b>	<b>Solubility, Part Three</b>	The ability to link its solubility to chemical processes	<b>2</b>	<b>Ninth</b>
<b>Tests and reports</b>	<b>theoretical</b>	<b>Acids and bases</b>	The ability to distinguish between them, understand their characteristics, and apply them .in life	<b>2</b>	<b>tenth</b>
<b>Tests and reports</b>	<b>theoretical</b>	<b>Qualitative analysis</b>	Focus on how concepts are understood and .applied	<b>2</b>	<b>eleventh</b>
<b>Tests and reports</b>	<b>theoretical</b>	<b>Introduction to Atomic Chemistry</b>	Understanding the structure of the atom and how atoms bond to form molecules	<b>2</b>	<b>twelfth</b>
<b>Tests and reports</b>	<b>theoretical</b>	<b>Theories of Atomic Chemistry</b>	Understanding the structure of the atom	<b>2</b>	<b>thirteenth</b>
<b>Tests</b>	<b>theoretical</b>	<b>A brief overview of radiochemistry</b>	The ability to handle radioactive materials and	<b>2</b>	<b>fourteenth</b>

<b>and reports</b>			<b>apply chemical techniques</b>		
				<b>2</b>	<b>fifteenth</b>

<b>Course structure (practical aspect) .10</b>					
<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	<b>Laboratory instruction, safety rule, equipment's</b>	<b>Acquiring basic knowledge of chemistry and developing scientific skills to conduct experiments</b>	<b>8</b>	<b>the first</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	<b>Practice with balances  (preparation of different types of solutions. Percentage sol (w/v %, v/v %, w/w %) ppm</b>	<b>The ability to describe the water cycle in nature</b>	<b>8</b>	<b>the second</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	<b>Practice with balances  (preparation of different types of solutions. Percentage sol (w/v %, v/v %, w/w %) ppm</b>	<b>This includes understanding the nature of solutions and how to classify them, such as the state of matter and solute .concentration</b>	<b>8</b>	<b>the third</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint,</b>	<b>Normal solution, molar solution, dilution</b>	<b>The ability to prepare standard and dilute solutions and</b>	<b>8</b>	<b>Fourth</b>

	followed by .a discussion		determine their concentrations		
Exams, discussions, and reports	The lecture was presented via PowerPoint, followed by .a discussion	Neutralization reaction  (standardization of NaOH against standard HCl  Determination of acetic acid in vinegar	Calculating the concentrations of reactants and products	8	Fifth
Exams, discussions, and reports	The lecture was presented via PowerPoint, followed by .a discussion	Oxid-edox titration Titration of KMNO <sub>4</sub> solution against oxalic acid	Calculating the concentrations of reactants and products	8	Sixth
Exams, discussions, and reports	The lecture was presented via PowerPoint, followed by .a discussion	Buffer solutions preparation and PH determination	The ability to link its solubility to chemical processes	8	Seventh
Exams, discussions, and reports	The lecture was presented via PowerPoint, followed by .a discussion	Identification of some common inorganic cation	The ability to link its solubility to chemical processes	8	Eighth
Exams, discussions, and reports	The lecture was presented via PowerPoint, followed by .a discussion	Identification of some common inorganic anions	The ability to link its solubility to chemical processes	8	Ninth
Exams, discussions, and reports	The lecture was presented via	Determination of melting point	The ability to distinguish between them, understand	8	tenth

	<b>PowerPoint, followed by .a discussion</b>		<b>their characteristics, and apply them .in life</b>		
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	Determination of boiling point	<b>Focus on how concepts are understood and .applied</b>	<b>8</b>	<b>eleventh</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	Reaction of some organic compounds (Aliphatic, aromatic alcohols, aldehyde and ketone)	<b>Understanding the structure of the atom and how atoms bond to form molecules</b>	<b>8</b>	<b>twelfth</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	<b>Aliphatic and aromatic carboxylic acid</b>	<b>Understanding the structure of the atom</b>	<b>8</b>	<b>thirteenth</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	<b>Scheme for identification</b>	<b>The ability to handle radioactive materials and apply chemical techniques</b>	<b>8</b>	<b>fourteenth</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	<b>Scheme for identification of solid organic compound</b>	<b>Acquiring basic knowledge of chemistry and developing scientific skills to conduct experiments</b>	<b>8</b>	<b>fifteenth</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint,</b>	Carbohydrates (monosacharides) Molish test Benedict, Barfoid test, Bile, Selvanoff's test, Osazon test	<b>The ability to describe the water cycle in nature</b>	<b>8</b>	<b>Sixteenth</b>

	followed by .a discussion				
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	Disacharides (hydrolysis of disaccharides by acids)	<b>This includes understanding the nature of solutions and how to classify them, such as the state of matter and solute .concentration</b>	<b>8</b>	<b>seventeenth</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	Determination of vit.c in orange	<b>The ability to prepare standard and dilute solutions and determine their concentrations</b>	<b>8</b>	<b>18th-19th</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	Scheme for identification of unknown carbohydrate sol	<b>Acquiring basic knowledge of chemistry and developing scientific skills to conduct experiments</b>	<b>8</b>	<b>Twenty- one</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	<b>Saponification experiment</b>	<b>The ability to describe the water cycle in nature</b>	<b>8</b>	<b>Twenty- second</b>

<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	<b>Proteins Biuret test, Sakaguchi test, cysteine test Ninhydrin test, xantho protein test, Molish test</b>	<b>This includes understanding the nature of solutions and how to classify them, such as the state of matter and solute .concentration</b>	<b>8</b>	<b>Twenty-third – Twenty-fourth – Twenty-fifth</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	<b>Precipitation of proteins (ionic strength PH, temp, solvents)</b>	<b>The ability to prepare standard and dilute solutions and determine their concentrations</b>	<b>8</b>	<b>Twenty-sixth – Twenty-seventh</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	<b>Paper chromatography techniques</b>	<b>Calculating the concentrations of reactants and products</b>	<b>8</b>	<b>Twenty-eighth - Twenty-ninth</b>
<b>Exams, discussions, and reports</b>	<b>The lecture was presented via PowerPoint, followed by .a discussion</b>	<b>Thin layer chromatography techniques</b>	<b>Calculating the concentrations of reactants and products</b>	<b>8</b>	<b>thirty</b>

<b>Course Evaluation .11</b>	
<b>The grade out of 100 is distributed according to the tasks assigned to the student, such as daily preparation, daily oral .and written exams, reports, etc</b>	
<b>Learning and teaching resources .12</b>	
	<b>Required textbooks (methodology, if applicable)</b>
	<b>Main references (sources)</b>
	<b>Electronic references and websites</b>

<b>1. Course Title: Bacteriology Medical</b>	
<b>Course Code .2</b>	
<b>3. Year : 2025-2026 / Term</b>	
<b>4. 2025/9/15 : Date this description was prepared</b>	
<b>.Available attendance formats : lecture in the classroom + laboratory .5</b>	
<b>Total study hours / Total unit hours : 4 hours / 3 unit hours .6</b>	
<b>: Name of the course coordinator (if there is more than one, please state) .7</b>	
<a href="mailto:ahmedhasan5@sci.utq.edu.iq">Email :ahmedhasan5@sci.utq.edu.iq</a>	Prof. Dr. Ahmed Hassan Mohamed
:Emailmohammadkhadhun@gmail.com	M M Muhammad Kazim Jari
<b>Course Objectives .8</b>	
<p>To give a general overview of bacteria as a type of microorganism .</p> <p>Building a scientific foundation on the topics of the course, enabling students to expand their ideas and understanding by consulting .relevant scientific sources</p> <p>Recognizing the importance of medical bacteria in our daily lives by studying the diseases they cause and by finding treatments for some health problems by utilizing these organisms in a scientifically sound .manner</p> <p>Studying modern tests that play a key role in the early diagnosis of some diseases caused by medical bacteria</p> <p>Expanding scientific and academic research and attempting to create unique and useful scientific research that enables both students and .professors to enter the labor market</p>	<b>Course Objectives</b>

## : Learning and teaching strategies .9

The education in this program includes theoretical education that focuses on .1 studying scientific problems in a purely scientific manner aimed at understanding the basis of the problem and searching for solutions to it, and practical education that provides practical experience in conducting experiments and research .through the use of methods approved in conducting scientific research Learning, in both its theoretical and practical aspects, depends on cooperation .2 between the student and the professor to understand the lesson as much as possible and to overcome the obstacles that hinder the student's understanding or .impede the conduct of his experiments in the laboratory Encourage students to use books and scientific articles, whether library or .3 electronic, because they greatly help in retaining information and allow for .discussion and conclusions

## Course structure (theoretical part) .10

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<i>Neisseria</i>	The student explains the characteristics of <i>Neisseria</i> bacteria and their role in human diseases.	2	the first
Daily exams and discussions	The lecture was presented	<i>Enteric Gram negative rods:</i>	The student distinguishes between Enteric Gram-negative rods and examples	2	the second

	via PowerPoint and discussed with the students	<b><i>E. coli</i></b>	such as <i>E. coli</i> and their role in intestinal infections.		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<b><i>Klebsiella</i></b>	The student explains the characteristics of <i>Klebsiella</i> and its importance in respiratory and urinary tract infections.	2	the third
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<b><i>Pseudomonas and Acinetobacter</i></b>	<i>Pseudomonas</i> and <i>Acinetobacter</i> bacteria and their role in hospital-acquired infections.	2	Fourth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<b><i>Shigella and Salmonella</i></b>	The student explains the characteristics of <i>Shigella</i> and <i>Salmonella</i> bacteria and their role in food poisoning and intestinal diseases.	2	Fifth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<b><i>Yersinia</i></b>	<i>Yersinia</i> bacteria and its associated diseases such as the plague.	2	Sixth
		<b><i>Vibrio</i></b>	The student explains the characteristics of <i>Vibrio</i> and its role in gastrointestinal infections such as cholera		Seventh

Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Campylobacter</i></b>	Campylobacter bacteria and their role in intestinal infections.	2	Eighth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Helicobacter pylori</i></b>	The student explains the characteristics of Helicobacter pylori and its relationship to stomach ulcers and stomach cancer.	2	Ninth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Haemophilus</i></b>	Haemophilus bacteria and their role in upper respiratory tract infections.	2	tenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Bordetella and Brucella</i></b>	The student learns the characteristics of Bordetella and Brucella and their role in respiratory diseases and animal tuberculosis.	2	eleventh
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Chlamydia</i></b>	<ul style="list-style-type: none"> <li>• The student explains <b>Chlamydia bacteria and their role in reproductive and respiratory diseases.</b></li> <li>•</li> </ul>	2	twelfth
Exams and discussions	The lecture was presented via	<b><i>Spirochetes</i></b>	Spirochetes bacteria and their role in diseases such as syphilis and leishmaniasis.	2	thirteenth

	PowerPoint and followed by .discussion				
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Mycobacterium</i></b>	The student explains the characteristics of Mycobacterium and its role in diseases such as tuberculosis and other viruses.	2	fourteenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Mycoplasma and Rickettsia</i></b>	The student describes the characteristics of Mycoplasma and Rickettsia and their role in respiratory infections and febrile diseases.		fifteenth

### 11. Course structure (practical part)

<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
Exams and discussions	The lecture was presented via PowerPoint	<b><i>Neisseria</i></b>	The student explains the characteristics of Neisseria bacteria and their role in human diseases.	7.5 Three days a week	the first

	and discussed with the .students				
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Enteric Gram negative rods: E. coli</i></b>	The student distinguishes between Enteric Gram-negative rods and examples such as E. coli and their role in intestinal infections.	7.5 Three days a week	the second
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Klebsiella</i></b>	The student explains the characteristics of Klebsiella and its importance in respiratory and urinary tract infections.	7.5 Three days a week	the third
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Pseudomonas and Acinetobacter</i></b>	Pseudomonas and Acinetobacter bacteria and their role in hospital acquired infections.	7.5 Three days a week	Fourth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Shigella and Salmonella</i></b>	The student explains the characteristics of Shigella and Salmonella bacteria and their role in food poisoning and intestinal diseases.	7.5 Three days a week	Fifth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Yersinia</i></b>	Yersinia bacteria and its associated diseases such as the plague.	7.5 Three days a week	Sixth

		<b><i>Vibrio</i></b>	The student explains the characteristics of <i>Vibrio</i> and its role in gastrointestinal infections such as cholera.	7.5 Three days a week	Seventh
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b><i>Campylobacter</i></b>	<i>Campylobacter</i> bacteria and their role in intestinal infections.	7.5 Three days a week	Eighth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b><i>Helicobacter pylori</i></b>	The student explains the characteristics of <i>Helicobacter pylori</i> and relationship to stomach ulcers and stomach cancer.	7.5 Three days a week	Ninth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b><i>Haemophilus</i></b>	<i>Haemophilus</i> bacteria and their role in upper respiratory tract infections.	7.5 Three days a week	tenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b><i>Bordetella and Brucella</i></b>	The student learns the characteristics of <i>Bordetella</i> and <i>Brucella</i> and their role in respiratory diseases and animal tuberculosis.	7.5 Three days a week	eleventh
Exams and discussions	The lecture was presented via	<b><i>Chlamydia</i></b>	<ul style="list-style-type: none"> <li>The student explains <b>Chlamydia</b> bacteria and their role in</li> </ul>	7.5	twelfth

	PowerPoint and discussed with the .students		<b>reproductive and respiratory diseases.</b> •	Three days a week	
Exams and discussions	The lecture was presented via PowerPoint and followed by .discussion	<b><i>Spirochetes</i></b>	Spirochetes bacteria and their diseases such as syphilis and leishmaniasis.	7.5 For each day and three days a week	thirteenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Mycobacterium</i></b>	The student explains the characteristics of Mycobacterium and its role in diseases such as tuberculosis and other viruses.	7.5 For each day and three days a week	fourteenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b><i>Mycoplasma and Rickettsia</i></b>	The student describes the characteristics of Mycoplasma and Rickettsia and their role in respiratory infections and febrile diseases.	7.5 Three days a week	fifteenth

### Course Evaluation .12

.Daily exams, monthly and final theoretical and practical exams, and classroom discussions

### Learning and teaching resources .13

ministerial portfolio	<b>Required (methodology)</b>	<b>textbook</b>
	<b>Main references (sources)</b>	
	<b>Recommended supporting books and references (scientific (.journals, reports, etc</b>	

	<b>Electronic websites</b>	<b>referenc</b>	
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## Course description template

<b>1. Biostatistics : Course Name Descriptive</b>	
<b>2. : Course code DEB04202</b>	
<b>3. Semester/Year 2025-2026 - Second Semester</b>	
<b>4. Date this description was prepared 15/9/2025</b>	
<b>5. .Available forms of attendance : Lecture in the classroom</b>	
<b>6. : Total study hours / Total unit hours 3 / hours 2 unit hours</b>	
<b>7. : Name of the course coordinator (if there is more than one, please state)</b>	
: Emailsuzan6303@gmail.com	Susan Yassin Adai
<b>8. Course Objectives</b>	
,Getting to know basic concepts such as data -1variables a .statistical distributions  Understanding the difference between descriptive and .inferential statistics  Analysis of mortality data and disease incidence rates-3  The ability to evaluate the validity and accuracy of medical .studies and to make accurate medical decisions	<b>Course Objectives</b>

## 9. : Learning and teaching strategies

The education in this course includes clarifying the theoretical aspect by presenting the statistical problem theoretically and finding solutions to it by using the statistical methods adopted in the curriculum. In addition, it guides students towards reviewing scientific research and articles because .of their impact on providing researchers and students with valuable information

## 10. Course structure (theoretical part)

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Exams and discussions	Presenting the lecture using PowerPoint	Definition of Biostatistics and Types of data	The student learns about the concept of medical .statistics and types of da	1	the first
Daily exams and discussions	Presenting the lecture using PowerPoint	Types of variance	The student learns about the types of contrast	1	the second
Exams and discussions	Presenting the lecture using PowerPoint	sources of data	The student knows what .the data sources are	1	the third
Exams and discussions	Presenting the lecture using PowerPoint	Methods of data collection	The student will be able identify data collection .methods	1	Fourth
Exams and discussions	Presenting the lecture using PowerPoint	sampling types	The student knows what types of data are	1	Fifth
Exams and discussions	Presenting the lecture using PowerPoint	Numerical methods of presentation of data	The student will be able identify methods of data .presentation	1	Sixth
Exams and discussions	Presenting the lecture using PowerPoint	Graphical methods of presentation of data	The student will be able identify graphical metho .for presenting data	1	Seventh

Exams and discussions	Presenting the lecture using PowerPoint	Measures of Non-central	He knows what the measures of .decentralization are	1	Eighth
Exams and discussions	Presenting the lecture using PowerPoint	Coefficient of variation	The student knows what the coefficient of variation .is	1	Ninth
Exams and discussions	Presenting the lecture using PowerPoint	Standard Error	The student knows what .the standard error is	1	tenth
Exams and discussions	The lecture was presented using .PowerPoint	Percentiles	The student knows what .percentage is	1	eleventh
Exams and discussions	Presenting the lecture using PowerPoint	Quartiles	The student knows what quarters are	1	twelfth
Exams and discussions	Presenting the lecture using PowerPoint	Interquartile Range	The student knows what .interquartile range is	1	thirteenth
Exams and discussions	The lecture was presented using .PowerPoint	Skewness measurement	The student knows the deviation scale	1	fourteenth
Exams and discussions	Presenting the lecture using PowerPoint	Elementary Probability theory	The student knows what .probability is	1	fifteenth

### . 1.1 Course Structure ( Practical Part )

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Discussion and Report	Presenting the lecture using PowerPoint	<b>Application of data types , Types of variables and sources of data.</b>	The student knows what types of data and what data sources are	2	the first
Discussion and Report	Presenting the lecture using PowerPoint	<b>Application of data collection and sampling types.</b>	The student learns about data collection applicatio .and data types	2	the second

Discussion and Report	Presenting the lecture using PowerPoint	Application of Numerical methods of presentation of data	The application of numerical methods to display data is known	2	the third
Discussion and Report	Presenting the lecture using PowerPoint	Application of Graphical methods of presentation of data	Applying graphical methods to display data	2	Fourth
Discussion and Report	Presenting the lecture using PowerPoint	Application of Mathematical methods of presentation of data, 1) Measures of central tendency (Arithmetic mean, Median, Mode) 2) Measures of Non central location (percentiles, Quartiles)	Knowledge of how to apply measures of central tendency	2	Fifth
Discussion and Report	Presenting the lecture using PowerPoint	Application of Measures of Dispersion (Range, variance, standard deviation) of ungrouped and group data, Coefficient of variation, Standard error	Applying standard deviation measures such as range and variance to grouped and ungrouped data	2	Sixth
Discussion and Report	Presenting the lecture using PowerPoint	Application of percentiles, Quartiles and Interquartile Range	Applying percentages	2	Seventh
Discussion and Report	Presenting the lecture using PowerPoint	<b>Application</b> of Moments, Skewness measurement	The student knows how to apply deviation measures	2	Eighth
Discussion and Report	Presenting the lecture using PowerPoint	<b>Application of elementary</b> probability theory.	Applying the probability theorem	2	Ninth

### Course Evaluation .12

Daily exams, monthly and final theoretical and practical exams, and classroom discussions

### Learning and teaching resources .13

ministerial portfolio	<b>Required</b> textbo <b>(methodology)</b>	
	<b>Main references (sources)</b>	
	<b>Recommended supporting books and references (scientific (journals, reports, etc</b>	

	<b>Websites</b>	
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<b>Course Name .1</b>
<b>Physiology</b>
<b>Course code .2</b>
<b>( Physiology Physiology (A</b>
<b>6 202 - 5 202 Semester/Year .3</b>
<b>Date of preparation of description .4</b>
<b>2025/9/15</b>
<b>Available forms of attendance .5</b>
<b>theoretical</b>
<b>Number of hours (total) / Number of units (total) .6</b>
<b>Two hours for the theoretical aspect / 8 hours for the practical aspect per week</b>
<b>Course coordinator's name: Name and university email .7</b>
<b>Dr. Duha Jihad Muhammad</b>  <a href="mailto:Doha.j.mohammad@nust.edu.iq">Doha.j.mohammad@nust.edu.iq</a>  <a href="mailto:alhusseinahmedhameed@gmail.com">alhusseinahmedhameed@gmail.com</a>
<b>M.M. Al-Hussein Ahmed Ha</b>  <b>M.M. Hajar Saud</b>
<b>Course objectives (subject matter objectives) .8</b>
<b>The student knows the science of physiology -1</b> <b>Knows the types of body systems and organs-2</b> <b>Understanding the relationship between physiology and other sciences -3</b> <b>He understands the overlap between the functions of the body's systems and -4</b> <b>.the interrelationship between them</b> <b>The student knows the normal function of each of the body's systems -5</b> <b>The student distinguishes between a normal condition and a pathological -6</b> <b>.condition</b> <b>Introducing the student to the components of body cells and the different -7</b> <b>.components of blood to enable the student to prepare for his work in the future</b> <b>The student distinguishes between physiology and other sciences in general. -8</b> <b>Physiology (the study of the functions of living organisms) differs from other</b> <b>sciences in that it focuses on how living organisms, their systems, and organs</b> <b>function to maintain their vital functions. While some other sciences focus on</b> <b>structure (such as anatomy), chemical reactions (such as biochemistry), or the</b> <b>effects of drugs (such as pharmacology), physiology studies normal biological</b>

processes such as respiration, digestion, excretion, nerve impulse transmission, and blood pressure regulation  
 In other words, physiology is concerned with describing "how the body works," while other sciences may focus on "what the body is made of?" or "how it changes when sick or due to drugs"

**Teaching and learning strategies .9**

Teaching and learning strategies for the subject of Physiology (the study of the functions of organs)  
 Teaching physiology requires effective strategies that integrate in-depth understanding, practical application, and active interaction between students and teachers. Here are some of the most important strategies used

**First: Teaching Strategies**  
 :Problem-based learning -1  
 :Inquiry-based teaching -2  
 :Cooperative learning -3  
 Clinical case-based learning-4  
 Interactive teaching -5  
 Experiential learning -6

**Second: Learning strategies for students**  
 :Mind maps and concept diagrams -1  
 :Technology-based education -2  
 :Brainstorming teaching technique-3  
 :The storytelling teaching strategy-4  
 :Learning through modeling-5

**Course structure (theoretical part) .10**

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
oral tests	Theoretical and practical lectures	Introduction to Physiology	General introduction to cell physiology: general functions and mechanisms of transport across the cell membrane	2	the first
oral test	Presentation and discussion	Body fluids	An overview of body fluids (types, composition, and functions)	2	the second
oral test	Active learning and	blood	Blood (in terms of its components, the specific function of	2	the third

	<b>practical applications</b>		<b>each component, and the difference between plasma (and serum</b>		
<b>Written test</b>	<b>Active learning</b>	<b>red blood cells</b>	<b>Understanding red blood cells definition, ) structure, and normal values..... hemoglobin in terms of definition, structure, normal values and an explanation of .blood types</b>	<b>2</b>	<b>Fourth</b>
<b>oral test</b>	<b>Presentations and images</b>	<b>Mechanism of red blood cell formation</b>	<b>Understanding the formation of red blood cells (erythropoiesis) , homeostasis, death, .disposed of</b>	<b>2</b>	<b>Fifth</b>
<b>oral test</b>	<b>Clinical case studies</b>	<b>white blood cells</b>	<b>Understanding white blood cells in terms of classification, special functions, .and normal values</b>	<b>2</b>	<b>Sixth</b>
<b>Tests and oral questions</b>	<b>Lectures</b>	<b>platelets</b>	<b>Understanding platelets definition, ) function, normal values). Platelet .formation coagulation processes</b>	<b>2</b>	<b>Seventh</b>
<b>Tests and oral questions</b>	<b>Presentations and lectures</b>	<b>Understanding the physiology of the heart</b>	<b>Understanding cardiac physiology in terms of the cardiac conduction system and cardiac</b>	<b>2</b>	<b>Eighth</b>

			<b>output (control mechanisms and .(influencing factors</b>		
<b>oral test</b>	<b>Presentations and lectures</b>	<b>Understanding vascular physiology</b>	<b>Understanding the physiology of blood vessels in terms of mechanics and .control</b>	<b>2</b>	<b>Ninth</b>
<b>oral test</b>	<b>Analysis of clinical cases</b>	<b>blood pressure</b>	<b>Understanding blood pressure and the factors that .affect it</b>	<b>2</b>	<b>tenth</b>
<b>Written test</b>	<b>Lecture and discussions</b>	<b>lymphatic system</b>	<b>Understanding and knowing the lymphatic system in terms of organs: the structure and function of each part, and the composition of .lymphatic fluid</b>	<b>2</b>	<b>eleventh</b>
<b>Tests</b>	<b>Self-learning and presentation</b>	<b>Respiratory</b>	<b>Understanding the respiratory system: its parts and the functions of each part. And understanding pulmonary ventilation in terms of its mechanics .and control</b>	<b>2</b>	<b>twelfth</b>
<b>oral test</b>	<b>presentation</b>	<b>Respiration mechanism</b>	<b>Knowledge of external respiration, the mechanism of gas transport in the blood, internal respiration mechanics, control,</b>	<b>2</b>	<b>thirteenth</b>

			<b>and influencing factors</b>		
<b>Written test</b>	<b>presentation</b>	<b>lung volumes</b>	<b>Understanding lung volumes, including normal values and influencing factors; conscious and unconscious control of breathing; and the role of the pons and medulla oblongata in regulating respiration</b>	<b>2</b>	<b>fourteenth</b>
<b>Comprehensive written test</b>	<b>presentation</b>	<b>Acid-base balance in the body</b>	<b>Understanding acid-base balance in terms of definition, and the role of body systems in regulation</b>	<b>2</b>	<b>fifteenth</b>

**Course structure (practical part )**

<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
Exams and discussions	The lecture was presented via PowerPoint, and the experiment was conducted practically in the laboratory	Urine Sample: Importance, Method of Collection	<b>General introduction to cell physiology: general functions and mechanisms of transport across the cell membrane</b>	2	the first
Exams and discussions	The lecture was presented via PowerPoint, and the experiment was conducted practically in the laboratory	Microscopic Examination of Urine	<b>An overview of body fluids (types, composition, and functions)</b>	2	the second
Exams and discussions	The lecture was presented via PowerPoint, and the experiment was conducted practically in the laboratory	Microscopic Examination of Urine: The identification of Bacteria	<b>Blood (in terms of its components, the specific function of each component, and the difference between plasma (and serum</b>	2	the third
Exams and discussions	The lecture was presented via PowerPoint, and the experiment was conducted practically in the laboratory	Blood Group	<b>Understanding red blood cells definition, ) structure, and normal values..... hemoglobin in terms of definition, structure, normal values and an explanation of blood types</b>	2	Fourth and f
and Exams discussions	The lecture was presented via PowerPoint, and the experiment was conducted practically in the laboratory	ESR	<b>Understanding the formation of red blood cells (erythropoiesis) , homeostasis, death,</b>	2	Sixth

			<b>and how they are disposed of</b>		
Exams and discussions	The lecture was presented via PowerPoint, and the experiment was conducted practically in the laboratory	Blood Pressure	<b>Understanding white blood cells in terms of classification, special functions, and normal values</b>	2	Seventh and eighth
Exams and discussions	The lecture was presented via PowerPoint, and the experiment was conducted practically in the laboratory	Body Temperature	<b>Understanding platelets (definition, function, normal values). Platelet formation and coagulation processes</b>	2	Ninth
Exams and discussions	The lecture was presented via PowerPoint, and the experiment was conducted practically in the laboratory	Semen Analysis: Type of Collection & Physical Examination	<b>Understanding cardiac physiology in terms of the cardiac conduction system and cardiac output (control mechanisms and influencing factors)</b>	2	Tenth and Eleventh
Exams and discussions	The lecture was presented via PowerPoint, and the experiment was conducted practically in the laboratory	Semen Analysis: Cell Counting Technique	<b>Understanding the physiology of blood vessels in terms of mechanics and control</b>	2	The second and thirteenth
Exams and discussions	The lecture was presented via PowerPoint, and the experiment was conducted practically in the laboratory	Repeat Semen Analysis.	<b>Understanding blood pressure and the factors that affect it</b>	2	fourteenth
Exams and discussions	The lecture was presented via PowerPoint, and the experiment was	Stethoscope and its uses.	<b>Understanding and knowing the lymphatic system</b>	2	fifteenth

	conducted practically in the laboratory		<b>in terms of organs: the structure and function of each part, and the composition of lymphatic fluid</b>		
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<b>Course Evaluation .11</b>	
<b>The grade out of 100 is distributed according to the tasks assigned to the student, such as daily preparation, daily oral and written exams, reports, etc</b>	
<b>Learning and teaching resources .12</b>	
<b>Merrill's Atlas of Radiographic Positions &amp; Radiologic Procedures</b> <b>Radiographic Positioning &amp; Related Anatomy</b>	<b>Required textbooks methodology, if ) (applicable</b>
<b>Vander's Human Physiology</b> <b>Berne and Levy Physiology</b>	<b>Main references (sources)</b>
<b>www.physiology.org (American Physiological Society)</b> <b>www.ncbi.nlm.nih.gov/pubmed (PubMed for research articles)</b> <b>www.khanacademy.org (Khan Academy - Biology and Physiology)</b> <b>www.medicalnewstoday.com (Medical News &amp; Updates)</b>	<b>Electronic references and websites</b>



<b>Parasitology :Course Name .1</b>	
<b>: Course code .2</b>	
<b>Term /Year : 2025-2026</b>	
<b>Date this description was prepared : 15/9/2025 .4</b>	
<b>Available attendance formats : lectures in classrooms and laboratories .5</b>	
<b>Total study hours/total units : 2 hours for the theoretical component and 8 hours for the practical component per week/2 units</b>	
<b>: Name of the course coordinator (if there is more than one, please state) .7</b>	
<b>Email</b> : <a href="mailto:hussamsbah1987@gmail.com">hussamsbah1987@gmail.com</a>	<b>M.M. Hossam El-Din Sabah Mahlal</b>
<b>Course Objectives .8</b>	
<b>Explanation and classification of medical parasites and explanation of their life cycle</b>	<b>Course Objectives</b>

## : Learning and teaching strategies .9

The education in this program includes theoretical education that focuses on .1 studying scientific problems in a purely scientific manner aimed at understanding the basis of the problem and searching for solutions to it, and practical education that provides practical experience in conducting experiments and research .through the use of methods approved in conducting scientific research Learning, in both its theoretical and practical aspects, depends on cooperation .2 between the student and the professor to understand the lesson as much as possible and to overcome the obstacles that hinder the student's understanding or .impede the conduct of his experiments in the laboratory Encourage students to use books and scientific articles, whether library or .3 electronic, because they greatly help in retaining information and allow for .discussion and conclusions

## Course structure (theoretical part) .10

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students  Then the work is divided among 6 groups, each group working on one or more .tests	<b>Platyhelminth: General characters.</b>  <b>Class cestoda: General characters.</b>	<ul style="list-style-type: none"> <li>• The student explains the general characteristics of flatworms (Platyhelminthes).</li> <li>•</li> </ul>	2	the first
Exams and discussions	The lecture was	<b>Teaniasaginata:</b>	<ul style="list-style-type: none"> <li>• The student learns the general</li> </ul>	2	the second

	<p>delivered via PowerPoint and included a discussion with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>	<p><b>Teianiasolium: Morphology &amp; the adult worm and the larval stages of each species, biology, life cycle of each species, pathogenicity of each species, Lab. Diagnosis</b></p>	<p><b>characteristics of the tapeworm class (Class Cestoda).</b></p> <ul style="list-style-type: none"> <li>•</li> </ul>		
Exams and discussions	<p>The lecture was delivered via PowerPoint and included a discussion with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>	<p><b>Hymenolepis nana, Hymenolepis diminuta.</b></p> <p><b>Dipylidium caninum, Diphylobathrium latum, Biology, morphology, pathogenicity of each species, Lab. Diagnosis.</b></p>	<ul style="list-style-type: none"> <li>• <b>The student explains the anatomy, life cycle, and pathogenic mechanism of the Taenia saginata worm.</b></li> <li>•</li> </ul>	2	the third
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>Then the work is divided among 6 groups, each group working on</p>	<p><b>Echinococcus granulosus. Echinococcus multilocularis.</b></p> <p><b>Biology, life cycle, pathogenicity, medical importance of hydatid cyst disease, Lab. Diagnosis.</b></p>	<ul style="list-style-type: none"> <li>• <b>The student explains the anatomy, life cycle, and pathogenic mechanism of the Taenia solium worm.</b></li> <li>•</li> </ul>	2	Fourth

	one or more .tests				
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>With the display of tissue sections where .available</p>	<p><b>The Glands Class Trematoda:</b>  <b>General characters.</b>  <b>Genus Schistosoma.</b>  <b>Specis of human schistosoma, life cycle.</b>  <b>Schistosoma hematobium.</b>  <b>Schistosoma mansoni.</b>  <b>Biology of adult worm, habitat, pathgenicity, Lab.diagnosis</b></p>	<ul style="list-style-type: none"> <li>• <b>The student distinguishes between the adult and larval life stages of both Hymenolepis nana and Hymenolepis diminuta and , knows the methods of laboratory diagnosis.</b></li> <li>•</li> </ul>	2	Fifth
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>With the display of tissue sections where .available</p>	<p><b>Fasciola hepatica</b>  <b>Biology, life cycle, pathogenicity, laboratory diagnosis.</b>  <b>Nemathelminthis.</b>  <b>Clss Nemtoda, general characters</b></p>	<ul style="list-style-type: none"> <li>• <b>The student explains the characteristics, life cycle, and diseases of Diplidium caninum and Diphylobothrium latum and the , methods of diagnosing them in the laboratory.</b></li> <li>•</li> </ul>	2	Sixth
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>With the display of tissue sections where .available</p>	<p><b>Ascaris lambricoides</b>  <b>Enterobius vermicularis.</b>  <b>Biology of adult worm, lifecycle, pathgenicity and medical importance of each species, Lab. Diagnosis of each species.</b></p>	<ul style="list-style-type: none"> <li>• <b>The student explains the biology, life cycle, and importance of Echinococcus granulosus disease.</b></li> <li>•</li> </ul>	2	Seventh

Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>With the display of tissue sections where .available</p>	<p><b>Trichuris trichura.</b> <b>Trichenala spiralis</b></p>	<ul style="list-style-type: none"> <li>• <b>The student learns about the biology and life cycle of Echinococcus multilocularis and its medical effects.</b></li> <li>•</li> </ul>	2	Eighth
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>With the display of tissue sections where .available</p>	<p><b>Biology, life cycle, pathogenicity, medical importance of each species, Lab. Diagnosis of each species..</b></p>	<ul style="list-style-type: none"> <li>• <b>The student explains the general characteristics of the liver fluke class (Trematoda).</b></li> <li>•</li> </ul>	2	Ninth
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>With the display of tissue sections where .available</p>	<p><b>Stroglyoides stercoralis.</b></p> <p><b>Biology, life cycle, pathogenicity, medical importance, Lab. Diagnosis.</b></p> <p><b>Ancylostomaduadendale, Necator Americans (Hooks worm)</b></p> <p><b>Biology, life cycle, pathogenicity, medical importance of each species, Lab. Diagnosis.</b></p>	<ul style="list-style-type: none"> <li>• <b>The student explains the general characteristics of the liver fluke class (Trematoda).</b></li> <li>•</li> </ul>	2	tenth

Exams and discussions	The lecture was presented using PowerPoint and discussed with the students. With the display of tissue sections where available.	<b>Ancylostomaduadene, Necator Americans (Hooks worm)</b>  <b>The filariae: Biology, pathogenicity and medical importance of each species, Lab. Diagnosis of each species. Visceral larvae migration, Cutaneous larvae migration.</b>	<ul style="list-style-type: none"> <li>• The student explains the biology and environment of the infection, the life cycle of Schistosoma haematobium and its pathological effect, in addition to methods of diagnosis.</li> <li>•</li> </ul>	2	eleventh
Exams and discussions	The lecture was presented using PowerPoint and discussed with the students. With the display of tissue sections where available.	<b>Biology, life cycle, pathogenicity, medical importance of each species, Lab. Diagnosis.</b>	<ul style="list-style-type: none"> <li>• The student explains the biology and environment of the infection, the life cycle of Schistosoma mansoni and its pathological effect, in addition to methods of diagnosis.</li> <li>•</li> </ul>	2	twelfth
Exams and discussions	The lecture was presented using PowerPoint and discussed with the students. With the display of tissue sections where available.	<b>The filariae: Biology, pathogenicity and medical importance of each species</b>	<ul style="list-style-type: none"> <li>• The student explains the biology and environment of the infection, the life cycle of Schistosoma mansoni and its pathological effect, in addition to methods of diagnosis.</li> <li>•</li> </ul>	2	thirteenth
Exams and discussions	The lecture was presented using	<b>Lab. Diagnosis of each species. Visceral larvae</b>	<ul style="list-style-type: none"> <li>• The student knows the general characteristics of the roundworm</li> </ul>	2	fourteenth

	PowerPoint and discussed with the .students  With the display of tissue sections where .available	<b>migration, Cutaneous larvae migration.</b>	<b>class(Class Nematoda).</b>  •		
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.11 Course structure (practical part )

<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students  Then the work is divided among 6 groups, each group working on one or more .tests	<b>Platyhelminth: General characters.</b>  <b>Class cestoda: General characters.</b>	• <b>The student explains the general characteristics of flatworms (Platyhelminthes).</b>  •	2	the first
Exams and discussions	The lecture was delivered via PowerPoint and included a discussion with the .students  Then the work is divided among 6	<b>Teiniasaginata:</b>  <b>Teiniasolium: Morphology &amp; the adult worm and the larval stages of each species, biology, life cycle of each species, pathologicinity of each species, Lab. Diagnosis</b>	• <b>The student learns the general characteristics of the tapeworm class (Class Cestoda).</b>  •	2	the second

	groups, each group working on one or more .tests				
Exams and discussions	<p>The lecture was delivered via PowerPoint and included a discussion with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>	<p><b>Hymenolepis nana, Hymenolepis diminuta.</b></p> <p><b>Dipylidium caninum, Diphylobathrium latum, Biology, morphology, pathogenicity of each species, Lab. Diagnosis.</b></p>	<ul style="list-style-type: none"> <li>• The student explains the anatomy, life cycle, and pathogenic mechanism of the Taenia saginata worm.</li> <li>•</li> </ul>	2	the third
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>	<p><b>Echinococcus granulosus. Echinococcus multilocularis.</b></p> <p><b>Biology, life cycle, pathogenicity, medical importance of hydatid cyst disease, Lab. Diagnosis.</b></p>	<ul style="list-style-type: none"> <li>• The student explains the anatomy, life cycle, and pathogenic mechanism of the Taenia solium worm.</li> <li>•</li> </ul>	2	Fourth
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p>	<p><b>The Glands Class Trematoda: General characters. Genus Schistosoma. Specis of human schistosoma, life cycle. Schistosoma hematobium. Schistosoma mansoni. Biology of adult worm, habitat, pathgenicity, Lab. diagnosis</b></p>	<ul style="list-style-type: none"> <li>• The student distinguishes between the adult and larval life stages of both Hymenolepis nana and Hymenolepis diminuta and , knows the methods</li> </ul>	2	Fifth

	With the display of tissue sections where .available		of laboratory diagnosis. •		
Exams and discussions	The lecture was presented using PowerPoint and discussed with the .students  With the display of tissue sections where .available	<b>Fasciola hepatica</b> <b>Biology, life cycle, pathogenicity, laboratory diagnosis.</b> <b>Nemathelminthis.</b> <b>Class Nematoda, general characters</b>	• The student explains the characteristics, life cycle, and diseases of <b>Dipylidium caninum</b> and <b>Diphyllobothrium latum</b> and the , methods of diagnosing them in the laboratory.  •	2	Sixth
Exams and discussions	The lecture was presented using PowerPoint and discussed with the .students  With the display of tissue sections where .available	<b>Ascaris lambricoides</b> <b>Enterobius vermicularis.</b> <b>Biology of adult worm, lifecycle, pathogenicity and medical importance of each species, Lab. Diagnosis of each species.</b>	• The student explains the biology, life cycle, and importance of <b>Echinococcus granulosus</b> disease.  •	2	Seventh
Exams and discussions	The lecture was presented using PowerPoint and discussed with the .students  With the display of tissue sections	<b>Trichuris trichura.</b> <b>Trichenala spiralis</b>	• The student learns about the biology and life cycle of <b>Echinococcus multilocularis</b> and its medical effects.  •	2	Eighth

	where .available				
Exams and discussions	The lecture was presented using PowerPoint and discussed with the .students  With the display of tissue sections where .available	<b>Biology, life cycle, pathogenicity, medical importance of each species, Lab. Diagnosis of each species..</b>	<ul style="list-style-type: none"> <li>• The student explains the general characteristics of the liver fluke class (Trematoda).</li> <li>•</li> </ul>	2	Ninth
Exams and discussions	The lecture was presented using PowerPoint and discussed with the .students  With the display of tissue sections where .available	<b>Stroglyoidesstercoralis.</b>  <b>Biology, life cycle, pathogenicity, medical importance, Lab. Diagnosis.</b>  <b>Ancylostomaduadenale, Necator Americans (Hooks worm)</b>  <b>Biology, life cycle, pathogenicity, medical importance of each species, Lab. Diagnosis.</b>	<ul style="list-style-type: none"> <li>• The student explains the general characteristics of the liver fluke class (Trematoda).</li> <li>•</li> </ul>	2	tenth
Exams and discussions	The lecture was presented using PowerPoint and discussed with the .students  With the display of tissue sections	<b>Ancylostomaduadenale, Necator Americans (Hooks worm)</b>  <b>The filariae: Biology, pathogenicity and medical importance of each species, Lab. Diagnosis of each species. Visceral larvae</b>	<ul style="list-style-type: none"> <li>• The student explains the biology and environment of the infection, the life cycle of Schistosoma haematobium and its pathological effect, in addition to methods of diagnosis.</li> </ul>	2	eleventh

	where .available	<b>migration, Cutaneous larvae migration.</b>	•		
Exams and discussions	The lecture was presented using PowerPoint and discussed with the .students  With the display of tissue sections where .available	<b>Biology, life cycle, pathogenicity, medical importance of each species, Lab. Diagnosis.</b>	<ul style="list-style-type: none"> <li>• The student explains the biology and environment of the infection, the life cycle of Schistosoma mansoni and its pathological effect, in addition to methods of diagnosis.</li> <li>•</li> </ul>	2	twelfth
Exams and discussions	The lecture was presented using PowerPoint and discussed with the .students  With the display of tissue sections where .available	<b>The filariae: Biology, pathogenicity and medical importance of each species</b>	<ul style="list-style-type: none"> <li>• The student explains the biology and environment of the infection, the life cycle of Schistosoma mansoni and its pathological effect, in addition to methods of diagnosis.</li> <li>•</li> </ul>	2	thirteenth
Exams and discussions	The lecture was presented using PowerPoint and discussed with the .students  With the display of tissue sections where .available	<b>Lab. Diagnosis of each species. Visceral larvae migration, Cutaneous larvae migration.</b>	<ul style="list-style-type: none"> <li>• The student knows the general characteristics of the roundworm class(Class Nematoda).</li> <li>•</li> </ul>	2	fourteenth

Exams and discussions	The lecture was presented using PowerPoint and discussed with the students.  With the display of tissue sections where available.	<b>.Visceral larvae migration, Cutaneous larvae migration.</b>	<ul style="list-style-type: none"> <li>• The student explains the biology, life cycle, and medical significance of both <i>Trichuris trichiura</i> and <i>Trichinella spiralis</i> and , methods of diagnosis.</li> <li>•</li> </ul>	2	fifteenth
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### Course Evaluation .11

Daily exams, monthly and final theoretical and practical exams, and discussions within the study laboratory

### Learning and teaching resources .12

	<b>Required textbo</b> <b>(methodology)</b>	
<b>Histology and cell biology: an introduction to pathology 5th<sup>edition</sup>, Kierszenbaum, Abraham L., author.; Tres, Laura L., author. 2020.</b>	<b>Main references (sources)</b>	
	<b>Recommended supporting books and references (scientific (.journals, reports, etc</b>	
	<b>Electronic referenc</b> <b>websites</b>	



**/ Course Name: Biochemistry .1**

**: BIOC220 Course code .2**

**Semester/Year 202 5 - 202 6 .3**

**Description prepared on : 15/9/2025 .4**

**Available attendance formats: classrooms and laboratory .5**

**Total number of hours / Total number of units: 4 units .6**

**Name of course coordinator .7**

**Dr. Imad Jassim Mohammed      imad-j.mohammed@nust.edu.iq  
M.M. Aqeel Kahit Khayoun  
Ayat Ahsat Muhammad SaeedM. .M**

**Course objectives (subject matter objectives) .8**

**Teaching students how to identify chemical compounds and providing them with sufficient information to understand the vital processes occurring in the human body at the molecular level, applying this knowledge through practical lessons, demonstrating the methods used in diagnosing certain diseases, and understanding all biological and medical analyses and tests and their role in diagnosing and helping to .determine the treatment of diseases**

## 9. Teaching and learning strategies

1. **دمج التعليم النظري والعملي** يركز البرنامج على تقديم تعليم نظري يهدف إلى دراسة المشكلات العلمية بمنهجية علمية دقيقة، لفهم جذور المشكلة واستكشاف الحلول المناسبة. بالإضافة إلى ذلك، يوفر التعليم العملي خبرة ميدانية في إجراء التجارب والبحوث باستخدام الأساليب المعتمدة في البحث العلمي.
2. **تعزيز التعاون بين الطالب والأستاذ** يعتمد البرنامج على التفاعل والتعاون بين الطالب والأستاذ لضمان استيعاب المادة العلمية بشكل كامل، وتذليل الصعوبات التي قد تعيق فهم الطالب أو تنفيذ التجارب المخبرية بفاعلية.
3. **تشجيع استخدام المصادر العلمية** يتم تحفيز الطلاب على الاستفادة من الكتب والمقالات العلمية، سواء كانت مطبوعة أو إلكترونية، لدورها الفعال في تعزيز حفظ المعلومات وتسهيل عملية المناقشة والوصول إلى استنتاجات علمية دقيقة.

**Course structure (theoretical part) .10**

<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Introduction of Biochemistry, Metabolism (Anabolism & Catabolism), Production of Energy	<ul style="list-style-type: none"> <li>• <b>The student learns the introduction to biochemistry and the importance of metabolism (anabolism) and catabolism) and energy production.</b></li> <li>•</li> </ul>	2	1
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Biochemistry and metabolism in illness and recovery. Obesity. Stress. Exercises	<ul style="list-style-type: none"> <li>• <b>The student explains the role of biochemistry and metabolism in disease and healing, with a focus on obesity, stress, and exercise.</b></li> <li>•</li> </ul>	2	2, 3

Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Biochemistry nutrition, dietary. Effect on health and preventive medicine	<ul style="list-style-type: none"> <li>• <b>The student explains the relationship between biochemical nutrition, healthy nutrition, and medical prevention.</b></li> <li>•</li> </ul>	2	<b>4, 5</b>
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Biochemistry as a Biochemical Basis in all diseases and sciences	<ul style="list-style-type: none"> <li>• <b>The student understands the importance of biochemistry as a scientific basis in all diseases and medical sciences.</b></li> <li>•</li> </ul>	2	<b>6.7</b>
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Biochemistry at Water PH, acid base balance	<ul style="list-style-type: none"> <li>• <b>The student explains the role of biochemistry in regulating water balance, pH, and acid-base balance in the body.</b></li> <li>•</li> </ul>	2	<b>8</b>
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Biochemistry and electrolytes	<ul style="list-style-type: none"> <li>• <b>The student learns about the role of biochemistry in regulating electrolytes and its effect</b></li> </ul>	2	<b>9</b>

			<p><b>on body functions.</b></p> <p>•</p>		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<p>Carbohydrate Metabolism: Mono/Disaccharides, polysaccharides</p> <p>Carbohydrate Metabolism: Pentose phosphate, Glucosamine, Proteoglycans</p>	<p>• <b>The student learns about the role of biochemistry in regulating electrolytes and its effect on body functions.</b></p> <p>•</p>	2	<b>10, 11</b>
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<p>ATP Synthesis and its Role in Carbohydrate Reactions</p>	<p>• <b>The student learns about the role of biochemistry in regulating electrolytes and its effect on body functions.</b></p> <p>•</p>	2	<b>12</b>
Exams and discussions	The lecture was presented via PowerPoint and followed by .discussion	<p>Lipids: Biosynthesis, oxidation, types.</p> <p>Metabolism of glycerol</p>	<p>• <b>The student learns about the role of biochemistry in regulating electrolytes and its effect on body functions.</b></p> <p>•</p>	2	<b>13, 14, 15</b>
<b>Chapter Two</b>					
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<p>Hormones Classification functions, Metabolism.</p> <p>(Its receptors and types of receptors and degradation)</p>	<p>• <b>The student learns about the classification of hormones, their functions and metabolic</b></p>	2	<b>3-2-1</b>

			<p><b>processes, including hormone receptors, their types and mechanisms of breakdown.</b></p> <p>• •</p>		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<p>Proteins:</p> <p>Structures and Functions of proteins and enzyme. Amino acids peptides.</p> <p>Structure and metabolism of proteins (Global proteins Fibrous proteins enzymes Myoglobin and hemoglobin)</p>	<p>• <b>The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown.</b></p> <p>•</p>	2	6-5-4
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	Metabolism of purine and pyrimidine	<p>• <b>The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown.</b></p>	2	8-7

			•		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Vitamins types and biochemical reactions.		2	<b>10-9</b>
Exams and discussions	The lecture was presented via PowerPoint and followed by .discussion	Minerals: • Definition, Classification • Dietary sources • Functions • Absorption, synthesis, metabolism, storage and excretion.	<ul style="list-style-type: none"> <li>• <b>The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown.</b></li> </ul>	2	<b>13-12-11</b>
Exams and discussions	The lecture was presented via PowerPoint and followed by .discussion	<p>Metabolism of Nucleotides Contents •</p> <p>Purine nucleotides Metabolism • Denovo synthesis of purine nucleotides • Salvage pathways of purine nucleotides • Catabolism of purine nucleotides .</p> <p>Pyrimidine nucleotide Metabolism • Denovo synthesis of pyrimidine nucleotides • Salvage pathways of pyrimidine nucleotides • Catabolism of pyrimidine nucleotides.</p>	<ul style="list-style-type: none"> <li>• <b>The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown.</b></li> </ul>	2	<b>15-14</b>

<b>Course structure (practical part)</b>					
<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
<b>First course</b>					
<b>Exams and discussions</b>	The lecture was presented via PowerPoint and discussed with the students	Specimen Collection [ blood, urine, CSF ] .	<ul style="list-style-type: none"> <li>• The student learns the introduction to biochemistry and the importance of metabolism (anabolism) and catabolism) and energy production.</li> <li>•</li> </ul>	<b>2</b>	<b>the first</b>
<b>Exams and discussions</b>	The lecture was presented via PowerPoint and discussed with the students	Specimen Transport and Specimen Processing.	<ul style="list-style-type: none"> <li>• The student explains the role of biochemistry and metabolism in disease and healing, with a focus on obesity, stress, and exercise.</li> </ul>	<b>2</b>	<b>the second</b>

			•		
<b>Exams and discussions</b>	The lecture was presented via PowerPoint and discussed with the students	Blood collection techniques, Anticoagulant, Separation of Serum.	• The student explains the relationship between biochemical nutrition, healthy nutrition, and medical prevention.	<b>2</b>	<b>the third</b>
<b>Exams and discussions</b>	The lecture was presented via PowerPoint and discussed with the students	Principles Of Instrumentation [ photometer, Colorimetry and Spectrophotometry Components ]	• The student understands the importance of biochemistry as a scientific basis in all diseases and medical sciences.	<b>2</b>	<b>Fourth</b>
<b>Exams and discussions</b>	The lecture was presented via PowerPoint and discussed with the students	<b>Qualitative test&amp; Quantitative Analysis</b>	• The student explains the role of biochemistry in regulating water balance, pH, and acid-base balance in the body.	<b>2</b>	<b>Fifth</b>
<b>Exams and discussions</b>	The lecture was presented via PowerPoint and discussed	<b>Carbohydrate tests</b>	• The student learns about the role of biochemistry in regulating electrolytes and its effect	<b>2</b>	<b>Sixth</b>

	with the .students		on body functions. •		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Molish test, Iodine test, Benedict's test and Barfoed test.	• The student learns about the role of biochemistry in regulating electrolytes and its effect on body functions. •	2	Seventh
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Seliwanoff's test, Osazone test, Athrone test and Dinitrosalicylic acid Method.	• The student learns about the role of biochemistry in regulating electrolytes and its effect on body functions. •	2	Eighth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Roe's method, Fehling's test, Somogyi-Nelson method and Mucic acid test.	• The student learns about the role of biochemistry in regulating electrolytes and its effect on body functions. •	2	Ninth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Amino acid tests	• The student learns the introduction to biochemistry and the importance of metabolism (anabolism )	2	tenth

			and catabolism) and energy production. •		
<b>Exams and discussions</b>	The lecture was presented via PowerPoint and discussed with the .students	Ninhydrin Test, Isatin Test and Xanthoprotic test.	• The student explains the role of biochemistry and metabolism in disease and healing, with a focus on obesity, stress, and exercise. •	<b>2</b>	<b>eleventh</b>
<b>Exams and discussions</b>	The lecture was presented via PowerPoint and discussed with the .students	Pauly's diazo test, Sakaguchi Test, Millon's Test	• The student explains the relationship between biochemical nutrition, healthy nutrition, and medical prevention. •	<b>2</b>	<b>twelfth</b>
<b>Exams and discussions</b>	The lecture was presented via PowerPoint and discussed with the .students	Ehrlich Test, Nitroprusside Test, Sullivan and McCarthy's Test	• The student understands the importance of biochemistry as a scientific basis in all diseases and medical sciences. •	<b>2</b>	<b>thirteenth</b>

<b>Exams and discussions</b>	The lecture was presented via PowerPoint and discussed with the .students	Specimen Collection [ blood, urine, CSF ] .	<ul style="list-style-type: none"> <li>• The student explains the role of biochemistry in regulating water balance, pH, and acid-base balance in the body.</li> <li>•</li> </ul>	<b>2</b>	<b>fourteenth</b>
<b>Exams and discussions</b>	The lecture was presented via PowerPoint and discussed with the .students	Specimen Transport and Specimen Processing.	<ul style="list-style-type: none"> <li>• The student learns about the role of biochemistry in regulating electrolytes and its effect on body functions.</li> <li>•</li> </ul>	<b>2</b>	<b>fifteenth</b>
<b>Second course</b>					
<b>Exams and discussions</b>	The lecture was presented via PowerPoint and discussed with the .students	<b>Laboratory Safety:</b> 1- Safety awareness of people and safety equipment. 2- Chemical safety.	<ul style="list-style-type: none"> <li>• The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown.</li> <li>• •</li> </ul>	<b>2</b>	<b>the first</b>

Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<b>Hopkins-Cole Test, Lead acetate Test</b>	<ul style="list-style-type: none"> <li>• The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown.</li> </ul>	<b>2</b>	<b>the second</b>
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<b>Lipids tests</b>	<ul style="list-style-type: none"> <li>• The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown.</li> </ul>	<b>2</b>	<b>the third</b>
Exams and discussions	The lecture was presented via PowerPoint and discussed	<b>Ethanol emulsion test, acrolein test, Sudan IV</b>	<ul style="list-style-type: none"> <li>•</li> </ul>	<b>2</b>	<b>Fourth</b>

	with the .students				
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Acid Value, Peroxide Value and Saponification Value</b>	<ul style="list-style-type: none"> <li>• The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown.</li> <li>•</li> </ul>	<b>2</b>	<b>Fifth</b>
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Iodine Value and Libermann-Burchard Method .(</b>	<ul style="list-style-type: none"> <li>• The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown.</li> <li>•</li> </ul>	<b>2</b>	<b>Sixth</b>
Exams and discussions	The lecture was presented via PowerPoint and	<b>Nucleic acids</b>	<ul style="list-style-type: none"> <li>• The student learns about the classification of hormones,</li> </ul>	<b>2</b>	<b>Seventh</b>

	discussed with the .students		their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown.  • •		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Diphenylamine Method, Fiske-Subbarow Method</b>	<ul style="list-style-type: none"> <li>• The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown.</li> <li>•</li> </ul>	2	<b>Eighth</b>
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Bial's orcinol Method and Quantitation of DNA by A260 nm</b>	<ul style="list-style-type: none"> <li>• The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and</li> </ul>	2	<b>Ninth</b>

			mechanisms of breakdown. •		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	Biochemistry at Water PH, acid base balance		2	tenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	Biuret protein assay and Folin-Lowry's Method	• The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown. •	2	eleventh
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	Bradford Method and Microkjeldal Method	• The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types	2	twelfth

			and mechanisms of breakdown. •		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	Isoelectric Point (pI)	• The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown. • •	2	thirteenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	Alkaline Phosphatase assay and Acid phosphatase assay .	• The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown. •	2	fourteenth

Exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<b>β-amylase assay and urease assay</b>	<ul style="list-style-type: none"> <li>• The student learns about the classification of hormones, their functions and metabolic processes, including hormone receptors, their types and mechanisms of breakdown.</li> </ul>	<b>2</b>	<b>fifteenth</b>
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<b>Course Evaluation .11</b>	
The grade out of 100 is distributed according to the tasks assigned to the student, such as daily preparation, daily oral and written exams, reports, etc	
<b>Learning and teaching resources .12</b>	
	<b>Required textbooks (methodology, if applicable)</b>
<b>1- Clinical Biochemistry Lecture notes. Geoffrey Beckett. Ninth Edition. A John Wiley &amp; Sons, Ltd., Publication</b>  <b>2 -Text book of Biochemistry for medical students Prasad R Manjeshwar. Revised Fourth Edition</b>  <b>3 -Harper's Illustrated. Biochemistry. LANGE medical book</b>  <b>Twenty-sixth edition. Robert K. Murray, Daryl K. Granner. Peter A. Mayes, Victor W. Rod well, PhD</b>	<b>Main references (sources)</b>

<b>4Lippincott's. Illustrated Reviews: Biochemistry. Fifth Edition</b>	
	<b>Electronic references and websites</b>

<b>Histology Practical :Course Name .1</b>	
<b>: Course code .2HIS04201</b>	
<b>Term /Year : 2025-2026</b>	
<b>Date this description was prepared : 15/9/2025 .4</b>	
<b>.Available forms of attendance : Lectures in the tissue laboratory .5</b>	
<b>:Total study hours .618 Total units : 9 units / hours</b>	
<b>: Name of the course coordinator (if there is more than one, please state) .7</b>	
	<p style="text-align: center;"><b>Dr. Safaa Jassim Ta'ma</b></p> <p style="text-align: center;"><b>M.B. Hawraa Abdul-Redha Hussein</b></p>
<b>Course Objectives .8</b>	
<p style="text-align: center;"><b>These cells are classified according to the study of the shape of the cells that form those tissues and the basic function of these cells, which constitute the various Human body tissues and organs are examined by .scanning thin slices of tissue under a microscope</b></p>	<p style="text-align: center;"><b>Course Objectives</b></p>

## **: Learning and teaching strategies .9**

The education in this program includes theoretical education that focuses on .1 studying scientific problems in a purely scientific manner aimed at understanding the basis of the problem and searching for solutions to it, and practical education that provides practical experience in conducting experiments and research .through the use of methods approved in conducting scientific research

Learning, in both its theoretical and practical aspects, depends on cooperation .2 between the student and the professor to understand the lesson as much as possible and to overcome the obstacles that hinder the student's understanding or .impede the conduct of his experiments in the laboratory

Encourage students to use books and scientific articles, whether library or .3 electronic, because they greatly help in retaining information and allow for .discussion and conclusions

Course structure

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Exams and discussions	<p>The lecture was presented via PowerPoint and discussed with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>	<p><b>Microscope: study the microscope parts of types and lines, how they can be used</b></p>	<ul style="list-style-type: none"> <li>• The student explains the parts of the microscope, its types, functions, and how it is used in laboratory testing.</li> <li>•</li> </ul>	2	the first
Exams and discussions	<p>The lecture was delivered via PowerPoint and included a discussion with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>	<p><b>Preparation of slides, methods and materials used</b></p>	<ul style="list-style-type: none"> <li>• The student applies the methods of preparing slides and the materials used in preparing them for microscopic examination.</li> <li>•</li> </ul>	2	the second
Exams and discussions	<p>The lecture was delivered via PowerPoint and included a discussion with the .students</p>	<p><b>Epithelial tissue</b></p>	<ul style="list-style-type: none"> <li>• The student learns the characteristics and types of epithelial tissue and its role in the body.</li> <li>•</li> </ul>	2	the third

	Then the work is divided among 6 groups, each group working on one or more .tests				
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>	<b>Epithelial tissue</b>	<ul style="list-style-type: none"> <li>• The student explains the structure and function of the different glands in the body.</li> <li>•</li> </ul>	2	Fourth
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>With the display of tissue sections where .available</p>	<b>The Glands</b>	<ul style="list-style-type: none"> <li>• The student distinguishes between the types of connective tissue and their basic functions.</li> <li>•</li> </ul>	2	Fifth
Exams and discussions	The lecture was presented using PowerPoint and discussed	<b>The Glands</b>	<ul style="list-style-type: none"> <li>• The student explains the structure of cartilage and its function in the body.</li> </ul>	2	Sixth

	with the .students  With the display of tissue sections where .available		•		
Exams and discussions	The lecture was presented using PowerPoint and discussed with the .students  With the display of tissue sections where .available	<b>Connective tissue</b>	<ul style="list-style-type: none"> <li>• <b>The student learns about the properties of bones and bone marrow and their vital roles.</b></li> <li>•</li> </ul>	2	Seventh
Exams and discussions	The lecture was presented using PowerPoint and discussed with the .students  With the display of tissue sections where .available	<b>Connective tissue</b>	The student explains the structure, function, and types of muscle tissue	2	Eighth
Exams and discussions	The lecture was presented using PowerPoint and discussed with the .students	<b>Cartilage</b>	<ul style="list-style-type: none"> <li>• <b>The student learns about the characteristics and functions of nervous tissue.</b></li> <li>•</li> </ul>	2	Ninth

	With the display of tissue sections where .available				
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>With the display of tissue sections where .available</p>	<b>Bone, bone marrow</b>	The student describes the structure of the brain, spinal cord, and the membranes surrounding them (meninges).	2	tenth
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>With the display of tissue sections where .available</p>	<b>Bone, bone marrow</b>	<ul style="list-style-type: none"> <li>• <b>The student explains the structure of bones and bone marrow and their functions in supporting the body and producing blood cells.</b></li> </ul>	2	eleventh
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>With the display of tissue sections</p>	<b>Muscular tissue</b>	<ul style="list-style-type: none"> <li>• <b>The student learns about the structure of muscle tissues, their types, and their functions in movement and support.</b></li> </ul>	2	twelfth

	where .available				
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>With the display of tissue sections where .available</p>	<b>Nervous tissue</b>	<ul style="list-style-type: none"> <li>• <b>The student explains the characteristics of nervous tissue and its role in transmitting nerve signals.</b></li> </ul>	2	thirteenth
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>With the display of tissue sections where .available</p>	<b>Brain, spinal cords, meninges</b>	<ul style="list-style-type: none"> <li>• <b>The student describes the structure of the brain, spinal cord, and the membranes surrounding them (meninges) and their functions in protecting the nervous system.</b></li> </ul>	2	fourteenth
Exams and discussions	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>With the display of tissue sections where .available</p>	<b>Brain, spinal cords, meninges</b>	<ul style="list-style-type: none"> <li>• <b>The student explains the structure of bones and bone marrow and their functions in supporting the body and producing blood cells.</b></li> </ul>	2	fifteenth

<b>1. Histopathology :Course Name</b>
<b>2. : Course code</b>

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

**4. Date this description was prepared : 15/9/2025**

**5. Available forms of attendance : Lectures in the tissue laboratory**

**6. Total study hours/total units : 2 hours per group/2 units**

**7. : Name of the course coordinator (if there is more than one, please state)**

:Emailalinaeemalshamki@gmail.com

M.M. Ali Naeem Maat Sultan

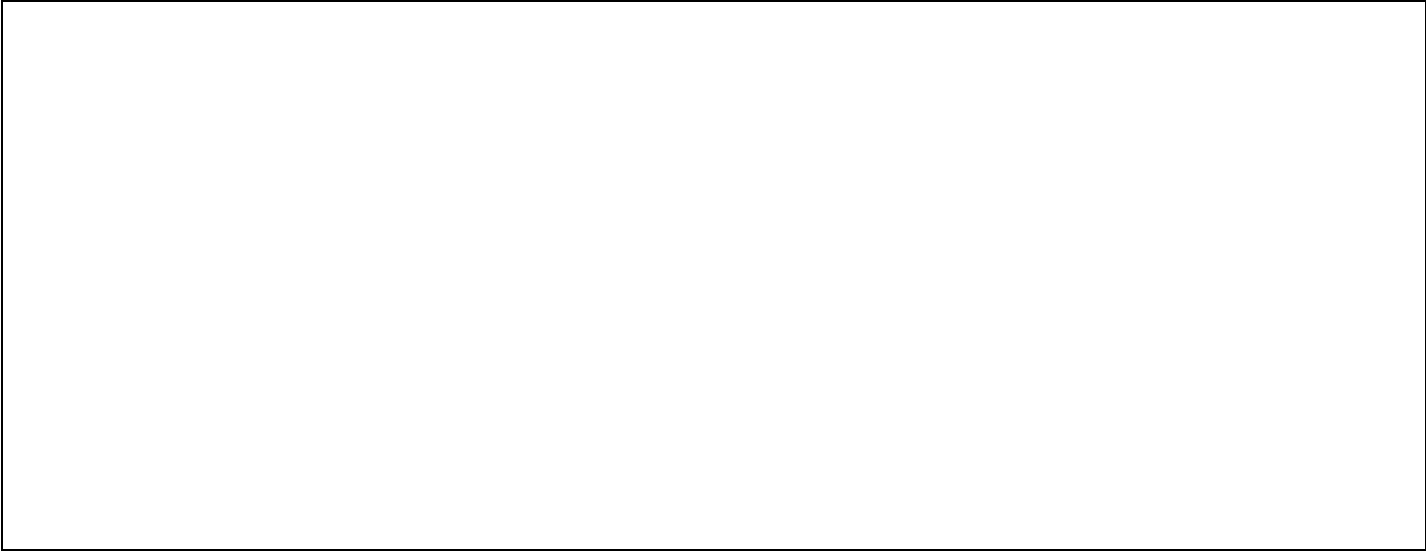
**8. Course Objectives**

**General objective:** To give the student a broad and up-to-date . pathology understanding of  
**Specific objective:** To establish a solid knowledge base on patholo .and modern technologies  
To enable the student to keep up with the medical community that .will live with after graduation in hospitals

**Course Objectives**

**9. : Learning and teaching strategies**

The education in this program includes theoretical education that focuses on .1 studying scientific problems in a purely scientific manner aimed at understanding the basis of the problem and searching for solutions to it, and practical education that provides practical experience in conducting experiments and research .through the use of methods approved in conducting scientific research  
Learning, in both its theoretical and practical aspects, depends on cooperation .2 between the student and the professor to understand the lesson as much as possible and to overcome obstacles that hinder the student's understanding or .impede the conduct of his experiments in the laboratory  
Students were urged to use books and scientific articles, whether physical or .3 electronic, as they greatly help in retaining information and allow for discussion .and conclusions



.11 Course structure (practical part )

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Exams and discussions  Quality of work during testing	The lecture was presented via PowerPoint and discussed with the .students  Then the work is divided among 6 groups, each group working on one or .more tests	<b>Pigments and minerals</b>	Understanding the types of pigments and minerals  Linking tissue changes to diseases	2 +2	the first
Exams and discussions  Quality of work during testing	The lecture was delivered via PowerPoint and included a discussion with the .students  Then the work is divided among 6 groups, each group working on one or more .tests	<b>Amyloid</b>	Defining amyloid and understanding its nature  Classification of Amyloid Types	2	the second
Exams and discussions  Quality of work during testing	The lecture was delivered via PowerPoint and	<b>Traditional stains and modern techniques for demonstrating microorganisms in histology</b>	Understanding traditional staining methods for microorganisms  Identifying tissue chemical stains  Commonly used in biology  minute	2	the third

	<p>included a discussion with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>		<p>Identifying microorganisms under light microscope using special stain</p>		
<p>Exams and discussions</p> <p>Quality of work during testing</p> <p>Take a daily exam</p>	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or .more tests</p>	<p><b>Neuropathology and muscle biopsy techniques</b></p>	<p>Understanding the fundamentals of neurology</p> <p>Determining the techniques for taking muscle biopsy samples</p> <p>Analysis of pathological histologic changes in neuromuscular diseases</p>	2	Fourth
<p>Exams and discussions</p> <p>Quality of work during testing</p>	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>	<p><b>Immunohistochemical techniques</b></p>	<p>Understanding the principles of immunochemistry</p> <p>Identifying the main components of an immunohistochemical stain</p> <p>Application of immunochemistry in diagnostic pathology</p>	2	Fifth

<p>Exams and discussions</p> <p>Quality of work during testing</p>	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or .more tests</p>	<p><b>Immunofluorescent techniques</b></p>	<p>Understanding the principles of immunofluorescence microscopy</p> <p>direct and Distinguishing between indirectIF techniques</p>		<p>Sixth</p>
<p>Exams and discussions</p> <p>Quality of work during testing</p> <p>Take a daily exam</p>	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>	<p><b>Flowcytometry techniques</b></p>	<p>Identifying the main components of flow cytometry device</p> <p>Design and preparation of samples for flow cytometry analysis</p>	<p>2</p>	<p>Seventh</p>
<p>Exams and discussions</p> <p>Quality of work during testing</p> <p>Take a daily exam</p>	<p>The lecture was delivered via PowerPoint and included a discussion with the .students</p>	<p><b>Enzyme histochemistry techniques</b></p>	<p>Identifying common enzymes that are detected by histochemical methods</p> <p>Application of histological chemis</p> <p>Enzymatic in pathology</p> <p>Diagnostic</p>	<p>2</p>	<p>Eighth</p>
<p>Exams and discussions</p>	<p>Then the work is divided</p>	<p><b>Transmission electron microscopy</b></p>	<p>Identifying the main components of transmission electron microscope</p> <p>Preparation of biological samples</p>	<p>2</p>	<p>Ninth</p>

Quality of work during testing Take a daily exam	among 6 groups, each group working on one or more tests		For inspection using a transmission microscope  Application of the transmission electron microscope in science  Diagnostic diseases  Such as kidney diseases and (neuromuscular diseases)		
Exams and discussions  Quality of work during testing  Take a daily exam	The lecture was delivered via PowerPoint and included a discussion with the students	<b>Molecular pathology</b>	Identifying molecular techniques in diagnostic pathology  Application of polymerase chain reaction (PCR)-based methods  In disease detection	+2	2
Exams and discussions  Quality of work during testing  Take a daily exam	Then the work is divided among 6 groups, each group working on one or more tests	<b>Diagnostic Cytology</b>	Identifying common sample types for cytological examination  Distinguishing between normal and abnormal cellular features	2	2
Exams and discussions  Quality of work during testing  Take a daily exam	The lecture was delivered via PowerPoint and included a discussion with the students	<b>Interpretation of Pap Smears and Fluid Cytology</b>	Understanding the basics of a cervical smear test  Hormonal changes are protected through epithelial cells	2	2
Exams and discussions  Quality of work during testing  Take a daily exam	Then the work is divided among 6 groups, each group working on one or more tests	<b>Interpretation of FNA Smears</b>	Understanding the basics of fine needle aspiration  Understanding the challenges and assistive technologies	4	4

Exams and discussions Quality of work during testing Take a daily exam	Then the work is divided among 6 groups, each group working on one or more tests	<b>Cytopreparatory techniques of Serous Effusions</b>	Understanding the causes of serous fluid accumulation  Sample collection and initial processing		fourteenth
Exams and discussions Quality of work during testing Take a daily exam	Then the work is divided among 6 groups, each group working on one or more tests	<b>Digital pathology</b>	Understanding digital pathology and its importance in modern diagnosis  Knowledge of slide scanning techniques and its analysis		fifteenth
<b>Course Evaluation .12</b>					
Daily exams, monthly and final theoretical and practical exams, and discussions within the study laboratory					
<b>Learning and teaching resources .13</b>					
			<b>Required textbooks (methodology)</b>		
<b>Pathologic basis of diseases, 8th edition, 2012</b> <b>Junqueira's basic histology, 15th edition, 2018</b> <b>Pathology illustrated, 17th edition, 2011.</b>			- - -	<b>Main references (sources)</b>	
			<b>Recommended supporting books and references (scientific journals, reports, etc)</b>		
			<b>Electronic references, websites</b>		



<b>Course Name .1</b>
<b>medical viruses</b>
<b>Course code .2</b>
<b>6 202 - 5 202 Semester/Year .3</b>
<b>2025/9/15 Date of preparation of description .4</b>
<b>Available forms of attendance .5</b>
<b>In person + hall</b>
<b>Number of hours (total) / Number of units (total) .6</b>
<b>hours, 4 units 8</b>
<b>Name of course coordinator (if there is more than one, please list .7 them): Name and university email</b>
<b>Dr. Haider Fadhil Akab (Theoretical Aspect)</b> <b><a href="mailto:biologist2511987@gmail.com">biologist2511987@gmail.com</a></b> <b>Dr. Sami Abbas (Practical Aspect)</b>
<b>Course objectives (subject matter objectives) .8</b>
<b>The student learns about the concept of medical virology, its transmission, pathogenicity, complications, dangers to humans, .methods of prevention, and treatment</b>
<b>Teaching and learning strategies .9</b>

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
<p>Oral questions</p> <p>MSQ</p> <p>The students discussed the lecture amongst themselves in a question-and-answer format</p>	<p>A lecture was presented via a projector screen, an explanation was given on the board, and a discussion was held with the students through questions and answers</p>	<p>General Properties of Viruses and Structure of Viruses.</p>	<p>Explaining the general characteristics of the virus in terms of its structure and components</p>	2	the first
<p>Oral questions</p> <p>MSQ</p> <p>The students discussed the lecture amongst themselves in a question-and-answer format</p>	<p>A lecture was presented via a projector screen, an explanation was given on the board, and a discussion was held with the students through questions</p>	<p>Classification and Nomenclature of Viruses Atypical Virus-like agents (Prions, Defective viruses, Pseudovirion, and Viriods).</p>	<p>Classification of viruses into complete viruses and incomplete viruses, classification according to their nucleic acid, methods of classification, and stages of taxonomy</p>	2	the second

	and .answers				
Oral questions  MSQ  The students discussed the lecture amongst themselves in a question-and-answer .format	A lecture was presented via a projector screen, an explanation was given on the board, and a discussion was held with the students through questions and .answers	Viral Genetic and Viral Replication.	Viral inheritance, replication strategies, their effect on the host cell, and the replication site according to .the virus	2	the third
Oral questions  MSQ  The students discussed the lecture amongst themselves in a question-and-answer format	A lecture was presented via a projector screen, an explanation was given on the board, and a discussion was held with the students through questions and .answers	Viral Pathogenesis and Transmission.	The mechanisms of virus transmission, whether from a human or .animal source  Or methods of vertical and horizontal transfer	2	Fourth
Oral questions	A lecture was presented	Immunity & Laboratory Diagnosis of Viruses.	The mechanisms of the immune	2	Fifth

<p>MSQ</p> <p>The students discussed the lecture amongst themselves in a question-and-answer .format</p>	<p>via a projector screen, an explanation was given on the board, and a discussion was held with the students through questions and .answers</p>		<p>system in responding to the virus, inducing inflammation, causing symptoms, controlling the disease, and its eventual end: Is it a cure, chronic, ?or latent</p>		
<p>Oral questions</p> <p>MSQ</p> <p>The students discussed the lecture amongst themselves in a question-and-answer .format</p>	<p>A lecture was presented via a projector screen, an explanation was given on the board, and a discussion was held with the students through questions and .answers</p>	<p>Herpes virus and Pox virus.</p>	<p>Identifying herpes viruses and their structure, modes of transmission, target organ, replication and pathogenicity, and .complications</p>	<p>2</p>	<p>Sixth</p>
<p>Oral questions</p> <p>MSQ</p> <p>The students discussed the lecture amongst themselves in</p>	<p>A lecture was presented via a projector screen, an explanation was given on the</p>	<p>Hepatitis virus.</p>	<p>Identifying hepatitis viruses and their structure, modes of transmission, target organ, replication and pathogenicity,</p>	<p>2</p>	<p>Seventh</p>

a question-and-answer format	board, and a discussion was held with the students through questions and answers		and complications		
Oral questions  MSQ  The students discussed the lecture amongst themselves in a question-and-answer format	A lecture was presented via a projector screen, an explanation was given on the board, and a discussion was held with the students through questions and answers	Human Immune Deficiency virus.	Identifying the HIV virus and its structure, methods of transmission to the target organ, its replication and pathogenicity, and its complications	2	Eighth
Oral questions  MSQ  The students discussed the lecture amongst themselves in a question-and-	A lecture was presented via a projector screen, an explanation was given on the board, and a discussion was held with the students	Orthomyxoviruses	Identifying influenza, mumps, and measles viruses: their structure, modes of transmission, target organ, replication, pathogenicity, and complications	2	Ninth

answer .format	through questions and .answers				
<p>Oral questions</p> <p>MSQ</p> <p>The students discussed the lecture amongst themselves in a question-and-answer format</p>	<p>A lecture was presented via a projector screen, an explanation was given on the board, and a discussion was held with the students through questions and .answers</p>	<p>Paramyxovirus.</p>	<p>Identifying influenza-like viruses and their structure, modes of transmission, target organ, replication and pathogenicity, and .complications</p>	<p>2</p>	<p>tenth</p>
<p>Oral questions</p> <p>MSQ</p> <p>The students discussed the lecture amongst themselves in a question-and-answer .format</p>	<p>A lecture was presented via a projector screen, an explanation was given on the board, and a discussion was held with the students through questions and .answers</p>	<p>Enteric viruses (Rota, Polio and Reo viruses)</p>	<p>Identifying enteroviruses and their structure, modes of transmission, target organ, replication and pathogenicity, and .complications</p>	<p>2</p>	<p>eleventh</p>

<p>Oral questions</p> <p>MSQ</p> <p>The students discussed the lecture amongst themselves in a question-and-answer format</p>	<p>A lecture was presented via a projector screen, an explanation was given on the board, and a discussion was held with the students through questions and answers</p>	<p>Rabies virus.</p>	<p>Identifying the rabies virus and its structure, methods of transmission to the target organ, its replication and pathogenicity, and its complications</p>	<p>2</p>	<p>twelfth</p>
<p>Oral questions</p> <p>MSQ</p> <p>The students discussed the lecture amongst themselves in a question-and-answer format</p>	<p>A lecture was presented via a projector screen, an explanation was given on the board, and a discussion was held with the students through questions and answers</p>	<p>Coronavirus.</p>	<p>Understanding coronaviruses and their structure, modes of transmission, target organ, replication and pathogenicity, complications, and epidemics they have caused</p>	<p>2</p>	<p>thirteenth</p>
<p>Oral questions</p> <p>MSQ</p> <p>The students discussed the</p>	<p>A lecture was presented via a projector screen, an</p>	<p>Bacteriophages.</p>	<p>Identifying bacteriophages and their structure, modes of transmission,</p>	<p>2</p>	<p>fourteenth</p>

<p>lecture amongst themselves in a question-and-answer format</p>	<p>explanation was given on the board, and a discussion was held with the students through questions and answers</p>		<p>and the bacteria they infect</p>		
<p>Oral questions</p> <p>MSQ</p> <p>The students discussed the lecture amongst themselves in a question-and-answer format</p>	<p>A lecture was presented via a projector screen, an explanation was given on the board, and a discussion was held with the students through questions and answers</p>	<p>Oncogenic viruses and Antiviral Drugs &amp; Viral vaccines</p>	<p>Identifying carcinogenic viruses and their structure, modes of transmission, target organ, replication and pathogenicity, complications, and the mechanism of transformation of normal cells into cancerous ones</p>	<p>2</p>	<p>fifteenth</p>

<b>Course evaluation .10</b>	
<p><b>The grade out of 100 is distributed according to the tasks assigned to the student, such as daily preparation, daily oral .and written exams, reports, etc</b></p> <p><b>Through daily exams, oral exams, in-class discussions, final .exams, and written exams</b></p>	
<b>Learning and teaching resources .11</b>	
<b>Ministerial decree (ministerial portfolio)</b>	<b>Required textbooks (methodology, if applicable)</b>
	<b>Main references (sources)</b>
	<b>Electronic references and websites</b>

### Course description template

<b>1. Analytical Biostatistics : Course Name</b>	
<b>2. : Course code ANA04302</b>	
<b>3. Term /Year : 2025-2026 - Second Semester</b>	
<b>4. Date this description was prepared 15/9/2025</b>	
<b>5. .Available forms of attendance : Lecture in the classroom</b>	
<b>6. : Total study hours / Total unit hours 4 / hours 2 unit hours</b>	
<b>7. : Name of the course coordinator (if there is more than one, please state)</b>	
: Emailsuzan6303@gmail.com	Susan Yassin Adai

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## 8. Course Objectives

<p>.To introduce the student to statistical analysis for scientific research</p> <p>Introducing the student to the importance and procedures of -2 .statistical tests</p> <p>Introducing the student to the types of statistical tests that suit the -3 .research objective</p> <p>.How to arrive at and interpret research results -4</p>	<b>Course Objectives</b>
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## 9. : Learning and teaching strategies

The education in this course includes clarifying the theoretical aspect by presenting the statistical problem theoretically and finding solutions to it by using the statistical methods adopted in the curriculum. In addition, it guides students towards reviewing scientific research and articles because .of their impact on providing researchers and students with valuable information

## 10. Course structure (theoretical part)

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Exams and discussions	Presenting the lecture using PowerPoint	Probability	The student understands .the concept of probabili	1	the first
Daily exams and discussions	Presenting the lecture using PowerPoint	Distribution	The student understands what is meant by .distributions	1	the second
Exams and discussions	Presenting the lecture using PowerPoint	Correlation	The student understands .the concept of correlatic	1	the third
Exams and discussions	Presenting the lecture using PowerPoint	Regression Analysis (Concept and analysis)	The student understands the concept of regressior .analysis	1	Fourth

Exams and discussions	Presenting the lecture using PowerPoint	Hypothesis Testing	The student knows what meant by hypothesis .testing	1	Fifth
Exams and discussions	Presenting the lecture using PowerPoint	Level of significance	The student understands what is meant by levels of .significance	1	Sixth
Exams and discussions	Presenting the lecture using PowerPoint	Degrees of freedom	The student understands what is meant by degree .of freedom	1	Seventh
Exams and discussions	Presenting the lecture using PowerPoint	Error type	The student knows what types of errors occur in .measurement	1	Eighth
Exams and discussions	Presenting the lecture using PowerPoint	Z - test	The student knows what theZ test is	1	Ninth
Exams and discussions	Presenting the lecture using PowerPoint	t-test	The student knows what -test is.	1	tenth
Exams and discussions	The lecture was presented using .PowerPoint	Chi-square test	The student knows what chi-square test is.	1	eleventh
Exams and discussions	Presenting the lecture using PowerPoint	Analysis of variance	The student understands analysis of variance	1	twelfth
Exams and discussions	Presenting the lecture using PowerPoint	Design and Analysis of Questionnaire	The student knows what meant by questionnaire .design and analysis	1	thirteenth
Exams and discussions	The lecture was presented using .PowerPoint	Final Report, Introduction, Statistical Analysis, Discussion Results	Prepare a report on the curriculum topics covered to determine the student' .level of knowledge	1	fourteenth
Exams and discussions	Presenting the lecture using PowerPoint	Revision	Review of what was explained during the chapter	1	fifteenth

### . 1.1 Course Structure ( Practical Part )

<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
Discussion and Report	Presenting the lecture using PowerPoint	<b>Elementary probability theory.</b>	The student knows the .probability theorem	3	the first
Discussion and Report	Presenting the lecture using PowerPoint	<b>Statistical estimation theory.</b>	The student knows what statistical estimation the .is	3	the second
Discussion and Report	Presenting the lecture using PowerPoint	Test of significant	He knows what is meant .by hypothesis testing	3	the third
Discussion and Report	Presenting the lecture using PowerPoint	Degree of freedom	He understands what .degrees of freedom are	3	Fourth
Discussion and Report	Presenting the lecture using PowerPoint	P-Value	P test is known	3	Fifth
Discussion and Report	Presenting the lecture using PowerPoint	Level of meaning	The student knows what the levels of significance .are	3	Sixth
Discussion and Report	Presenting the lecture using PowerPoint	Types of error	He is aware of the types .errors	3	Seventh
Discussion and Report	Presenting the lecture using PowerPoint	<b>Different types of t-tests</b>	The difference between types of tests	3	Eighth
Discussion and Report	Presenting the lecture using PowerPoint	Chi square	?What is the K-test	3	Ninth
Discussion and Report	Presenting the lecture using PowerPoint	Significance tests	?What are significance t	3	tenth
Discussion and Report	Presenting the lecture using PowerPoint	One-way ANOVA test	Understanding what ANOVA ( One-Way Analysis of Variance) is	3	eleventh
Discussion and Report	Presenting the lecture	Correlation coefficients	What are correlation ?coefficients	3	twelfth

	using PowerPoint				
<b>Course Evaluation .12</b>					
Daily exams, monthly and final theoretical and practical exams, and classroom .discussions					
<b>Learning and teaching resources .13</b>					
ministerial portfolio			<b>Required textbooks (methodology)</b>		
			<b>Main references (sources)</b>		
			<b>Recommended supporting books and references (scientific (.journals, reports, etc</b>		
			<b>Websites</b>		



<b>Endocrinology :Course Name .1</b>	
<b>: Course code .2</b>	
<b>Term /Year : 2025-2026</b>	
<b>Date this description was prepared : 15/9/2025 .4</b>	
<b>.Available attendance formats : Clinical Chemistry Laboratory lectures .5</b>	
<b>Total study hours / Total units : 2 hours per group / 3 units .6</b>	
<b>: Name of the course coordinator (if there is more than one, please state) .7</b>	
<b>Email</b> : <a href="mailto:aqeel.k.khayoon@sci.utq.edu.iq">aqeel.k.khayoon@sci.utq.edu.iq</a>	M.M. Aqeel Kahit Khayoun Mohsen
<b>Course Objectives .8</b>	
<p>To give a general idea of the endocrine glands and the hormones they secrete, as it is one of the specialties or related to .clinical chemistry .1</p> <p>Building a scientific foundation on the topics of the course, enabling students to expand their ideas and understanding by consulting relevant scientific sources .2</p> <p>Understanding the importance of hormones in our daily lives by studying each gland and the hormones associated with that gland .3</p> <p>Studying modern tests that play a key role in the early diagnosis of some diseases caused by glandular disorders .4</p> <p>Understanding each hormone and how it works using the equipment in the laboratory .5</p>	<b>Course Objectives</b>

Expanding scientific and academic research and attempting to .5  
create unique and useful scientific research that enables both  
.students and professors to enter the labor market

## **: Learning and teaching strategies .9**

The education in this program includes theoretical education that focuses on .1  
studying scientific problems in a purely scientific manner aimed at understanding  
the basis of the problem and searching for solutions to it, and practical education  
that provides practical experience in conducting experiments and research  
.through the use of methods approved in conducting scientific research  
Learning, in both its theoretical and practical aspects, depends on cooperation .2  
between the student and the professor to understand the lesson as much as  
possible and to overcome the obstacles that hinder the student's understanding or  
.impede the conduct of his experiments in the laboratory  
Encourage students to use books and scientific articles, whether library or .3  
electronic, because they greatly help in retaining information and allow for  
.discussion and conclusions

Course structure (practical part )

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
<p>Exams and discussions</p> <p>Quality of work during testing</p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>	<p><i>Estimated of GH</i></p>	<p>Diagnosis of -1 growth hormone disorders</p> <p>Diagnosis of -2 diseases caused by growth hormone disorder</p> <p>COBBS device and ELISA technique</p>	<p>2 +2</p>	<p>First and second</p>
<p>Exams and discussions</p> <p>Quality of work during testing</p>	<p>The lecture was delivered via PowerPoint and included a discussion with the .students</p>	<p><i>Estimated Insulin</i></p>	<p>Diagnosis of -1 insulin hormone disorders and its role in diabetes</p> <p>Diabetes care -2</p> <p>COBBS device and ELISA technique</p>	<p>2</p>	<p>the third</p>

	Then the work is divided among 6 groups, each group working on one or more .tests				
Exams and discussions  Quality of work during testing	The lecture was delivered via PowerPoint and included a discussion with the .students  Then the work is divided among 6 groups, each group working on one or more .tests	<i>Estimated TSH</i>	Diagnosis of -1 thyroid disorders  COBBS device and ELISA technique	2	Fourth
Exams and discussions	The lecture was presented using	<i>Estimated of T3, T4</i>	Diagnosis of thyroid disorders  Diagnosing the -2 cause of the rise and fall	2	Fifth

<p>Quality of work during testing</p> <p>Take a daily exam</p>	<p>PowerPoint and discussed with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>		<p>COBBS device and ELISA technique</p>		
<p>Exams and discussions</p> <p>Quality of work during testing</p>	<p>The lecture was presented using PowerPoint and discussed with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>	<p><b><i>Estimated Prolactin</i></b></p>	<p>Diagnosis of -1 pituitary gland disorder</p> <p>Low milk supply -2 in pregnant women</p> <p>COBBS device and ELISA technique</p>	<p>2</p>	<p>Sixth</p>

<p>Exams and discussions</p> <p>Quality of work during testing</p>	<p>The lecture was presented using PowerPoint and discussed with the students.</p> <p>Then the work is divided among 6 groups, each group working on one or more tests.</p>	<p><i>Estimated of hCG</i></p>	<p>Pregnancy -1 diagnosis and monitoring, and tumor diagnosis</p> <p>Practicing the -2 work of performing insulin hormone tests using the COBBS device and ELISA technique</p>		<p>Seventh</p>
<p>Exams and discussions</p> <p>Quality of work during testing</p> <p>Take a daily exam</p>	<p>The lecture was presented using PowerPoint and discussed with the students.</p> <p>Then the work is divided among 6 groups, each group working</p>	<p><i>Estimated of Estradiol</i></p>	<p>Chemical -1 composition and manufacturing</p> <p>Physiological -2 function</p> <p>Link to clinical -3 cases</p> <p>Critical thinking -4</p> <p>COBBS device and ELISA technique</p>	<p>2</p>	<p>Eighth</p>

	on one or more .tests				
Exams and discussions Quality of work during testing Take a daily exam	The lecture was delivered via PowerPoint and included a discussion with the .students	<b><i>Estimated Estrogen</i></b>	Chemical composition and manufacturing Physiological -2 function Link to clinical -3 cases Linking to -4 lifestyles COBBS device and ELISA technique	2	Ninth
Exams and discussions Quality of work during testing Take a daily exam	Then the work is divided among 6 groups, each group working on one or more .tests	<b><i>Estimated Progesterone</i></b>	Chemical composition and manufacturing Physiological -2 function Link to clinical -3 cases Linking to -4 lifestyles COBBS device and ELISA technique	2	tenth
Exams and discussions Quality of work during testing	The lecture was delivered via PowerPoint and included a discussion with	<b><i>Estimated LH and FSH</i></b>	Physiological -1 function Link to clinical -2 cases Linking to -3 lifestyles Contributing to -4 the diagnosis Practicing insulin -5 hormone testing using theCOBBS	+2 2	eleventh

Take a daily exam	the .students		device and ELISA technique		
Exams and discussions Quality of work during testing Take a daily exam	Then the work is divided among 6 groups, each group working on one or more .tests	<b>Estimated ACTH</b>	Chemical composition and manufacturing Physiological -2 function Link to clinical -3 cases Reasons for -4 measurement COBBS device and ELISA technique	2	Twelfth a thirteenth
Exams and discussions Quality of work during testing Take a daily exam	The lecture was delivered via PowerPoint and included a discussion with the .students	<b>Estimated Cortisol</b>	Chemical composition and manufacturing The physiological -2 function of the normal state Link to clinical -3 cases Linking to -4 lifestyles COBBS device and ELISA technique	2	fourteenth
Exams and discussions Quality of work during testing	Then the work is divided among 6 groups, each group working on one or more .tests	<b>Estimated by AFP</b>	Chemical composition and manufacturing Physiological -2 function and pregnancy Link to clinical -3 cases Tumor indicator -4 COBBS device and ELISA technique	4	fifteenth

Take a daily exam					
Exams and discussions Quality of work during testing	<p>The lecture was presented via PowerPoint and discussed with the .students</p> <p>Then the work is divided among 6 groups, each group working on one or more .tests</p>	<i>Estimated of GH</i>	<p>Diagnosis of -1 growth hormone disorders</p> <p>Diagnosis of -2 diseases caused by growth hormone disorder</p> <p>Practicing the -3 work of performing growth hormone testing using the COBBS device and ELISA technique</p>	2 +2	First and second
Exams and discussions Quality of work during testing	<p>The lecture was delivered via PowerPoint and included a discussion with the .students</p>	<i>Estimated Insulin</i>	<p>Diagnosis of -1 insulin hormone disorders and its role in diabetes</p> <p>Diabetes care -2</p> <p>COBBS device and ELISA technique</p>	2	the third

	Then the work is divided among 6 groups, each group working on one or more .tests				
<b>Course Evaluation .12</b>					
Daily exams, monthly and final theoretical and practical exams, and discussions within the .study laboratory					
<b>Learning and teaching resources .13</b>					
ministerial portfolio		<b>Required (methodology)</b>		<b>textbook</b>	
<p>Textbook of biochemistry (Sixth Edition) For Medical Students D Vasudevan, Sreekumari S and Kannan Vaidyanathan .</p> <p>-2Textbook of Medical Biochemistry Eighth Edition 2012. MN Chatterjea Rana Shinde .</p> <p>-3Clinical Biochemistry Lecture Notes. Tenth Edition Hoboken, N Wiley, 2018. Peter Rae. Mike Crane. Rebecca Pattenden</p> <p>-4Biochemistry. Fourth Edition, 2013. Dr. U. Satyanarayana Dr. U Chakrapani.Elsevier India Private Limited .</p> <p>-5Clinical biochemistry &amp; metabolic medicine eighth edition published in 2012 by Hodder Arnold. Professor Martin Andrew Crook</p> <p>6- Textbook of Medical Biochemistry Eighth Edition 2012. M Chatterjea Rana Shinde</p>		<b>Main references (sources)</b>			
		<b>Recommended supporting books and references (scientific (.journals, reports, etc</b>			
Google Scholar		<b>Electronic websites</b>		<b>referenc</b>	





## 19. : Learning and teaching strategies

Using **multimedia** such as scientific images, videos, and 3D models to .10 understand the cell's cellular structure and components

Interacting with students during lectures by asking questions and engaging in .11 .discussions to ensure a deeper understanding of the topics

Using educational tools such as scientific images and models makes the material .12 .more accessible to students

Encouraging students to learn independently through books, scientific articles, .13 and electronic resources that promote understanding and contribute to enriching .knowledge

Use **continuous assessments** such as **quizzes** , assignments, and classroom .14 . discussions to periodically evaluate students' understanding

## 20. Course structure (practical part)

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	DNA extraction from bacteria and tissues	Diagnosis of -1 growth hormone disorders  Diagnosis of -2 diseases caused by growth hormone disorder  COBBS device and ELISA technique	1:30	the first
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	polymerase chain reaction	Diagnosis of -1 insulin hormone disorders and its role in diabetes  Diabetes care -2  COBBS device and ELISA technique	1:30	the second
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	TraditionalPCR	Diagnosis of -1 thyroid disorders  COBBS device and ELISA technique	1:30	the third

Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	reversePCR	Diagnosis of thyroid disorders  Diagnosing the -2 cause of the rise and fall  COBBS device and ELISA technique	1:30	Fourth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	MultiplePCR	Diagnosis of -1 pituitary gland disorder  Low milk supply -2 in pregnant women  COBBS device and ELISA technique	1:30	Fifth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Real-timePCR	Pregnancy -1 diagnosis and monitoring, and tumor diagnosis  Practicing the -2 work of performing insulin hormone tests using the COBBS device and ELISA technique	1:30	Sixth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	electrical migration	Chemical -1 composition and manufacturing  Physiological -2 function  Link to clinical -3 cases  Critical thinking -4  COBBS device and ELISA technique	1:30	Seventh
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Electrophoresis of different sample sizes	Chemical composition and manufacturing  Physiological -2 function  Link to clinical -3 cases	1:30	Eighth

			<p>Linking to -4 lifestyles</p> <p>COBBS device and ELISA technique</p>		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Genetic data analysis	<p>Chemical composition and manufacturing</p> <p>Physiological -2 function</p> <p>Link to clinical -3 cases</p> <p>Linking to -4 lifestyles</p> <p>COBBS device and ELISA technique</p>	1:30	Ninth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Single nucleotide polymorphisms	<p>Physiological -1 function</p> <p>Link to clinical -2 cases</p> <p>Linking to -3 lifestyles</p> <p>Contributing to -4 the diagnosis</p> <p>COBBS device and ELISA technique</p>	1:30	tenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	preliminary design	<p>Chemical composition and manufacturing</p> <p>Physiological -2 function</p> <p>Link to clinical -3 cases</p> <p>Reasons for -4 measurement</p> <p>COBBS device and ELISA technique</p>	1:30	eleventh
Exams and discussions	The lecture was presented via PowerPoint and discussed	Practical preliminary design	<p>Chemical composition and manufacturing</p>	1:30	twelfth

	with the .students		The physiological -2 function of the normal state  Link to clinical -3 cases  Linking to -4 lifestyles  COBBS device and ELISA technique		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	sequence	Chemical composition and manufacturing  Physiological -2 function and pregnancy  Link to clinical -3 cases  Tumor indicator -4  COBBS device and ELISA technique	1:30	thirteenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	Sequence data refers	Diagnosis of -1 growth hormone disorders  Diagnosis of -2 diseases caused by growth hormone disorder  COBBS device and ELISA technique	1:30	fourteenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	exam	Diagnosis of -1 insulin hormone disorders and its role in diabetes  Diabetes care -2  COBBS device and ELISA technique	1:30	fifteenth

### Course Evaluation .12

.Daily exams, monthly and final theoretical and practical exams, and classroom discussions

General and transferable skills (other skills related to employability and personal -1  
 .(development

The student acquired general skills through practical experience in collecting -2  
 .pathological samples and methods of handling them

Self-development through keeping up with the latest developments in the field of -3  
 specialization and contributing to and participating in training courses, lectures and  
 . scientific seminars prepared for this purpose

**Learning and teaching resources .13**

Medical genetics. Sixth edition, June 1	<b>Required textbook (methodology)</b>	
	<b>Main references (sources)</b>	
	<b>Recommended supporting books and references (scientific (.journals, reports, etc</b>	
<a href="https://www.ncbi.nlm.nih.gov">https://www.ncbi.nlm.nih.gov</a>	<b>,Electronic references Internet sites</b>	

**Course structure (theoretical part)**

<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Definition, ) importance, general functions of (blood</b>	<b>Introduction to Hematology</b>	<b>2</b>	<b>the first</b>
Visual .1 learning Auditory .2 learning Self-learning .3	Exams and .1 . tests Short tests .2 Duties .3 Practical .4	<b>Red blood cell formation, red blood cell morphology,</b>	<b>Blood formation</b>	<b>4</b>	<b>Second and third</b>

Experiential .4 learning	Examinations	<b>red blood cell cell membrane, and red blood cell metabolism</b>			
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Composition, ) structure, and levels in the blood and in (red blood cells</b>	<b>hemoglobin</b>	<b>2</b>	<b>Fourth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Definition, ) causes, (classification</b>	<b>anemia</b>	<b>2</b>	<b>Fifth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Iron deficiency anemia</b>	<b>Iron metabolism</b>	<b>2</b>	<b>Sixth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Megaloblastic anemia vitamin B12 ) deficiency, causes and diagnosis) and pernicious anemia</b>	<b>Megaloblastic anemia (vitamin B12 deficiency, causes and diagnosis) and pernicious anemia</b>	<b>2</b>	<b>Seventh</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Folic acid deficiency causes and ) (diagnosis</b>	<b>Folic acid deficiency causes and ) (diagnosis</b>	<b>2</b>	<b>Eighth</b>

Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>hemolytic anemia</b>	<b>hemolytic anemia</b>	<b>4</b>	<b>The ninth and tenth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Definitions, ) Types, Causes (and Diagnosis</b>	<b>Thalassemia</b>	<b>2</b>	<b>eleventh</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>sickle cell anemia</b>	<b>sickle cell anemia</b>	<b>2</b>	<b>twelfth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>aplastic anemia</b>	<b>aplastic anemia</b>	<b>2</b>	<b>thirteenth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>polycythemia</b>	<b>polycythemia</b>	<b>2</b>	<b>fourteenth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations		<b>Material review</b>	<b>2</b>	<b>fifteenth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Classification ) and general functions of (each</b>	<b>white blood cells</b>	<b>2</b>	<b>Chapter 2, Week 1</b>

Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Neutrophilia, ) neutropenia, eosinophilia, eosinophilia, (mononucleosis</b>	<b>Non-malignant white blood cell diseases</b>	<b>2</b>	<b>the second</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>lymphocyte disorders</b>	<b>lymphocyte disorders</b>	<b>2</b>	<b>the third</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Leukemia: ) Definition, Types, Classification, Causes, Leukemia (Reactions</b>	<b>Non-malignant white blood cell diseases</b>	<b>2</b>	<b>Fourth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Acute ) lymphocytic leukemia, acute myeloid leukemia) Causes and diagnosis of each</b>	<b>acute leukemia</b>	<b>2</b>	<b>Fifth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Chronic lymphocytic leukemia (CLL) and chronic myeloid leukemia (CML): Causes and</b>	<b>chronic leukemia</b>	<b>2</b>	<b>Sixth</b>

		<b>diagnosis of .each</b>			
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Hodgkin ) lymphoma, causes, laboratory (results</b>	<b>lymphoma</b>	<b>2</b>	<b>Seventh</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Non-Hodgkin lymphoma: causes and laboratory findings</b>	<b>Non-Hodgkin lymphoma: causes and laboratory findings</b>	<b>2</b>	<b>Eighth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>General form ) (and functions</b>	<b>platelets</b>	<b>2</b>	<b>Ninth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Stop the bleeding</b>	<b>Stop the bleeding</b>	<b>2</b>	<b>tenth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Bleeding disorders</b>	<b>Bleeding disorders</b>	<b>4</b>	<b>Eleventh and twelfth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Arterial thrombosis, venous thrombosis, and risk factors</b>	<b>Arterial thrombosis, venous thrombosis, and risk factors</b>	<b>4</b>	<b>Thirteenth and fourteenth</b>
Visual .1 learning Auditory .2	Exams and .1 . tests Short tests .2		<b>Material review</b>	<b>2</b>	<b>fifteenth</b>

learning Self-learning .3 Experiential .4 learning	Duties .3 Practical .4 Examinations				
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<b>Course structure (practical part)</b>					
<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
<b>Exams, discussions, reports, and quick questions</b>	<b>Present the lecture using PowerPoint</b>	<b>Blood draw</b>	<b>Introduction to Hematology</b>	<b>2</b>	<b>the first</b>
<b>Exams, discussions, reports, and quick questions</b>	<b>Present the lecture using PowerPoint</b>	<b>blood percentage</b>	<b>Blood formation</b>	<b>2</b>	<b>the second</b>
<b>Exams, reports, and questions</b>	<b>Present the lecture using PowerPoint</b>	<b>platelets</b>	<b>hemoglobin</b>	<b>2</b>	<b>the third</b>
<b>Exams and reports</b>	<b>Lecture presentation</b>	<b>red blood cells</b>	<b>anemia</b>	<b>2</b>	<b>Fourth</b>
<b>Exams and reports</b>	<b>Lecture presentation</b>	<b>blood cell formations</b>	<b>Iron metabolism</b>	<b>2</b>	<b>Fifth</b>
<b>Daily exams and reports</b>	<b>Present the lecture using PowerPoint</b>	<b>Blood stimulants</b>	<b>Megaloblastic anemia (vitamin B12 deficiency, causes and diagnosis) and</b>	<b>2</b>	<b>Sixth</b>

			<b>pernicious anemia</b>		
<b>Exams and daily reports</b>	<b>Present the lecture using PowerPoint</b>	<b>blood viscosity</b>	<b>Folic acid deficiency causes and ) (diagnosis</b>	<b>2</b>	<b>Seventh</b>
<b>Reports / Daily Exams</b>	<b>Present the lecture using PowerPoint</b>	<b>sickle cells</b>	<b>hemolytic anemia</b>	<b>2</b>	<b>Eighth</b>
<b>Daily reports/exams</b>	<b>Present the lecture using PowerPoint</b>	<b>white blood cells</b>	<b>Thalassemia</b>	<b>2</b>	<b>Ninth</b>
<b>Daily Reports Exam /</b>	<b>Present the lecture using PowerPoint</b>	<b>Retinal cells</b>	<b>sickle cell anemia</b>	<b>2</b>	<b>tenth</b>
<b>Teaching students how blood clots</b>	<b>Present the lecture using PowerPoint</b>	<b>Coagulation time</b>	<b>aplastic anemia</b>	<b>2</b>	<b>eleventh</b>
<b>Daily reports/exams</b>	<b>Present the lecture using PowerPoint</b>	<b>prothrombin time</b>	<b>polycythemia</b>	<b>2</b>	<b>twelfth</b>
<b>How anticoagulants work</b>	<b>Present the lecture using PowerPoint</b>	<b>anticoagulants</b>	<b>Material review</b>	<b>2</b>	<b>thirteenth</b>
<b>Questions about the</b>	<b>PowerPoint presentation</b>	<b>Material review</b>	<b>Introduction to Hematology</b>	<b>2</b>	<b>fourteenth</b>

<b>previous material</b>					
<b>Reports</b>	<b>PowerPoint presentation</b>	<b>Discussion of student reports</b>	<b>Blood formation</b>	<b>2</b>	<b>fifteenth</b>

## Course evaluation .1

The grade is distributed out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral and written exams, .reports, etc

**:Midterm grade = 40 points from**

**marks for the theory exam + 5 marks for the tests and 20 .1 .presentations**

**marks for the practical exam + 5 marks for tests and 5 marks for 10 .2 .reports and attendance**

**.Final grades = 60 come from the final theoretical exam**

**Total score = 100**

## Learning and teaching resources .2

**Required textbooks  
(methodology, if applicable)**

**Hematology: Basic Principles and  
Practice, 7th Edition.**

**Hoffbrand's Essential Haematology  
8th Edition**

**Main references (sources)**

**Electronic references and  
websites**





## **Course Description / Fourth Stage / System: Courses**

## Course description template

<b>12. : Course Name</b>	
(Clinical) Advanced Clinical Immunology	
<b>13. : Course code</b>	
<b>14. : Chapter/Year</b>	
quarterly	
<b>15. : Date this description was prepared</b>	
2025/11/10	
<b>16. : Available attendance formats</b>	
Lecture in the classroom + laboratory	
<b>17. : Number of study hours (total) / Number of units (total)</b>	
hours theory + 2 hours practical / 8 units 2	
<b>18. : Name of the course coordinator (if there is more than one, please state)</b>	
<b>: Emailsada2020.bio@utq.edu.iq</b>  <b>:Email</b>	<b>Dr. Sada Ghaleb Taher (Theoretical (Aspect</b>  <b>M.M. Hamza Maleh Dakhil (Practical (Aspect</b>
<b>19. Course Objectives</b>	
<b>This course aims to provide students with a comprehensive understanding of the immune mechanisms involved in inflammatory and autoimmune diseases, with a focus on the effects of the immune system in kidney, liver, and respiratory diseases, as well as related disorders. The objectives include:</b>	<b>Course Objectives</b>

1. understanding of immune diseases
2. Acquiring laboratory and diagnostic skills
3. Developing critical thinking and medical analysis skills
4. Developing research and investigative skills
5. Diagnosis of autoimmune diseases.

## 20. : Learning and teaching strategies

### *Direct Instruction*

Lectures (questions and discussion) .15  
Laboratory skills .16  
White board .17

### *Technology-Based Learning*

This includes the use of technology tools such as educational videos, augmented reality, and e-learning.

### *Differentiated Instruction*

#### *Differentiated Learning*

#### *Interactive Teaching*

#### *Question-Based Teaching*

#### *Experiential Learning*

## 21. Course structure (theoretical part)

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
) Written Exams -1MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the students.	Rheumatoid Arthritis	<ul style="list-style-type: none"> <li>□ Understanding the immune mechanisms that cause disease, including the role of T and B cells and cytokines.</li> <li>□ Identifying clinical symptoms and differential diagnosis of the disease.</li> <li>□ Knowledge of available treatments, including immunosuppressant drugs and biological therapies.</li> </ul>	2	the first
Written Exams -(MCQ ( -2Case-Based Assessment	The lecture was presented using PowerPoint, diagrams were used on the	Systemic Lupus Erythmatosus	<ul style="list-style-type: none"> <li>□ Studying the immunological, genetic, and environmental causes of the disease.</li> </ul>	2	the second

<p>Evaluation -3 through group discussions(Group Discussions &amp; Debates)</p> <p>-4Oral Exams</p>	<p>board, and a discussion was held with the .students</p>		<ul style="list-style-type: none"> <li>▢ Identifying the different clinical patterns and the impact of the disease on vital organs.</li> <li>▢ Understanding the role of autoantibodies (such as Anti-dsDNA, Anti-Smith).</li> </ul>		
<p>Written Exams -(MCQ (</p> <p>-2Case-Based Assessment</p> <p>Evaluation -3 through group discussions(Group Discussions &amp; Debates)</p> <p>-4Oral Exams</p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students</p>	<p>Ankylosing Spondylitis</p>	<ul style="list-style-type: none"> <li>▢ Identifying the relationship between genes such as)HLA-B27) and disease.</li> <li>▢ Understanding the mechanisms of chronic inflammation and its impact on the spine and joints.</li> <li>▢ Long-term treatment and symptom management strategies.</li> </ul>	<p style="text-align: center;"><b>2</b></p>	<p>the third</p>
<p>Written Exams -(MCQ (</p> <p>-2Case-Based Assessment</p> <p>Evaluation -3 through group discussions(Group Discussions &amp; Debates)</p> <p>-4Oral Exams</p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students</p>	<p>Sjogren's Syndrome</p>	<ul style="list-style-type: none"> <li>▢ Identifying the effect of the disease on the salivary and tear glands.</li> <li>▢ Analysis of autoimmunity in the disease and its relationship to other diseases.</li> <li>▢ Evaluation of diagnostic tests such as the Schirmer test and SSA/SSB antibodies</li> </ul>	<p style="text-align: center;"><b>2</b></p>	<p>Fourth</p>
<p>Written Exams -(MCQ (</p> <p>-2Case-Based Assessment</p> <p>Evaluation -3 through group discussions(Group Discussions &amp; Debates)</p> <p>-4Oral Exams</p>	<p>The lecture was presented via PowerPoint and discussed with the .students</p>	<p>Behcet's Disease</p>	<ul style="list-style-type: none"> <li>▢ Understanding the inflammatory mechanisms and the impact of the disease on blood vessels.</li> <li>▢ Diagnosing typical symptoms such as oral ulcers and eye inflammation.</li> <li>▢ Identifying the immunotherapies used to control symptoms.</li> </ul>	<p style="text-align: center;"><b>2</b></p>	<p>Fifth</p>
<p>Written Exams -(MCQ (</p> <p>-2Case-Based Assessment</p> <p>Evaluation -3 through group discussions(Group</p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students</p>	<p>Psoriatic Arthritis</p>	<ul style="list-style-type: none"> <li>▢ Understanding the relationship between psoriasis and joint diseases .</li> <li>▢ Understanding the immune factors that lead</li> </ul>	<p style="text-align: center;"><b>2</b></p>	<p>Sixth</p>

Discussions & Debates) -4Oral Exams			to inflammation and joint damage. Learning about biological therapies and the latest developments in disease management.		
Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the students	Gluten-sensitive enteropathy	Understanding the role of autoimmunity in the gut's response to gluten.  □ Identifying pathological changes in the small intestine.  □ Studying laboratory and diagnostic tests (such as TTG-IgA .( antibodies	2	Seventh
Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the students	Pernicious Anemia	□ Studying the role of autoimmunity in the destruction of the parietal cells of the stomach.  Analysis of the relationship between vitamin B12 deficiency and clinical symptoms.  Identifying methods of diagnosis and treatment with vitamin replacement.	2	Eighth
Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the students	Diabetes mellitus	□ Studying the role of T cells in destroying pancreatic beta cells.  Understanding the impact of genetic and environmental factors on disease development.  Analysis of immunotherapy strategies and modern receptors for stem cell therapy.	2	Ninth
Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the students	Ulcerative Colitis Crohn's Disease	Comparison between immune inflammation in both ulcerative colitis and Crohn's disease. Studying the role of the microbiome and chronic inflammation in these diseases. Understanding the available biological	2	tenth

			therapies and immunotherapies.		
Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students	<i>Helicobacter pylori</i> Mucosa-associated lymphoid tissue lymphoma and <i>Helicobacter pylori</i> associated diseases	<ul style="list-style-type: none"> <li>□ They are investigating how <i>Helicobacter pylori</i> infection affects tumor development and the immune system.</li> <li>□ Identifying the relationship between <i>H. pylori</i> stomach cancer, , and chronic gastritis.</li> <li>□ Studying the effect of eliminating infection on associated diseases.</li> </ul>	2	eleventh
Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students	And Autoimmune Hepatitis Autoimmune liver diseases	<ul style="list-style-type: none"> <li>□ Differentiating between autoimmune hepatitis and viral hepatitis.</li> <li>□ Studying the relationship between the immune system and liver cirrhosis.</li> <li>□ Knowledge of the immunosuppressive therapies used.</li> </ul>	2	twelfth
Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students	Primary Biliary Cirrhosis Primary Sclerosing Cholangitis	<ul style="list-style-type: none"> <li>Understanding the role of the immune system in the destruction of bile ducts.</li> <li>Analysis of diagnostic tests such asAMA in primary biliary cirrhosis.</li> <li>Knowledge of modern treatment strategies.</li> </ul>	2	thirteenth
Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students	Renal disease	<ul style="list-style-type: none"> <li>identifying kidney diseases</li> <li>identifying the most common diseases</li> </ul>	2	fourteenth

<p>Written Exams -(MCQ (</p> <p>-2Case-Based Assessment</p> <p>Evaluation -3 through group discussions(Group Discussions &amp; Debates)</p> <p>-4Oral Exams</p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students</p>	<p>Circulating immune complex</p> <p>In situ immune complex formulation</p> <p>Antineutrophil Cytoplasmic Autoantibodies and associated diseases</p>	<p>A study of the formation of immune complexes and their effect on the kidneys.</p> <p>□ Understanding autoimmune glomerulonephritis (such asIgA Nephropathy, Lupus Nephritis).</p>	<p>2</p>	<p>fifteenth</p>
<p>Written Exams -(MCQ (</p> <p>-2Case-Based Assessment</p> <p>Evaluation -3 through group discussions(Group Discussions &amp; Debates)</p> <p>-4Oral Exams</p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students</p>	<p>T Lymphocyte mediated Renal Injury</p> <p>Immunological Mediators in Acute inflammation</p>	<p>Understanding the role of T cells in kidney infections.</p>	<p>2</p>	<p>Sixteenth</p>
<p>Written Exams -(MCQ (</p> <p>-2Case-Based Assessment</p> <p>Evaluation -3 through group discussions(Group Discussions &amp; Debates)</p> <p>-4Oral Exams</p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students</p>	<p>Primary glomerulonephritis) membranous glomerular nephritis (Nephrotic Syndrome)</p>	<p>A study of the formation of immune complexes and their effect on the kidneys.</p>	<p>2</p>	<p>seventeenth</p>
<p>Written Exams -(MCQ (</p> <p>-2Case-Based Assessment</p> <p>Evaluation -3 through group discussions(Group Discussions &amp; Debates)</p> <p>-4Oral Exams</p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students</p>	<p>Post infection Glomerular nephritis IgA nephropathy</p>	<p>□ Understanding autoimmune glomerulonephritis (such asIgA Nephropathy, Lupus Nephritis).</p>	<p>2</p>	<p>eighteenth</p>
<p>Written Exams -(MCQ (</p> <p>-2Case-Based Assessment</p> <p>Evaluation -3 through group discussions(Group Discussions &amp; Debates)</p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students</p>	<p>Lupus Nephritis Henoch-Schonlein Purpura</p>	<p>□ Identifying the role of antibodies and cells in kidney damage.</p>	<p>2</p>	<p>nineteenth</p>

-4Oral Exams					
Written Exams -(MCQ (	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students	Vasculitis-Associated Glomerular Lesion  Anti-Glomerular Basement Membrane Disease	A study of the formation of immune complexes and their effect on blood vessels in the kidneys.	2	Twenty
-2Case-Based Assessment  Evaluation -3 through group discussions(Group Discussions & Debates)  -4Oral Exams					
Written Exams -(MCQ (	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students	Respiratory Diseases  Drug-induced Respiratory disease	Analysis of the role of innate and acquired immunity in respiratory diseases.	2	Twenty-first
-2Case-Based Assessment  Evaluation -3 through group discussions(Group Discussions & Debates)  -4Oral Exams					
Written Exams -(MCQ (	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students	Eosinophilic Pneumonias	Understanding the role of eosinophils in pneumonia and asthma	2	Twenty-second
-2Case-Based Assessment  Evaluation -3 through group discussions(Group Discussions & Debates)  -4Oral Exams					
Written Exams -(MCQ (	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students	Occupational & Environmental lung Diseases	Understanding the impact of environmental and occupational factors on immunity	2	Twenty-third
-2Case-Based Assessment  Evaluation -3 through group discussions(Group Discussions & Debates)  -4Oral Exams					
Written Exams -(MCQ (	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students	Asthma	They are the immune response mechanisms in asthma, including the role of T cells(Th2) and cytokines such asIL-4 ,IL-5 andIL-13.	2	Twenty-fourth
-2Case-Based Assessment  Evaluation -3 through group discussions(Group					

Discussions & Debates) -4Oral Exams			<ul style="list-style-type: none"> <li>□ Understanding the difference between allergic asthma and non-allergic asthma.</li> <li>□ Studying the role of histamine and eosinophils in respiratory inflammation.</li> </ul>		
Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the students	Non-Allergic Bronchitis	<ul style="list-style-type: none"> <li>□ Differentiating between allergic and non-allergic bronchitis in terms of pathogenesis and immune response.</li> <li>Understanding the role of viral and bacterial infections and environmental irritants in disease development.</li> <li>□ Studying the effect of chronic inflammation on the airways and the associated tissue changes.</li> </ul>	2	Twenty-fifth
Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the students	Hypersensitivity Diseases	<ul style="list-style-type: none"> <li>□ Understanding the classifications of hypersensitivity according to the Coombs and Gell classification: <ul style="list-style-type: none"> <li>• Type I: Immediate Hypersensitivity, as in allergic asthma and hay fever.</li> <li>• Type II: Antibody-mediated hypersensitivity, as in immune hemolytic anemia.</li> <li>• Type III: Immune Complex-mediated hypersensitivity, as in systemic lupus erythematosus.</li> <li>• Type IV: Delayed-Type Hypersensitivity as in contact dermatitis.</li> </ul> </li> <li>Studying the immune components involved in each type of hypersensitivity, such as IgE and IgG antibodies and T cells</li> </ul>	2	Twenty-sixth

Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students	Hemolytic anemia	Understanding the mechanisms of immune lysis of red blood cells.  □ Studying the role of autoantibodies in stimulating hemolysis.  Knowledge of diagnostic and treatment methods.	2	Twenty-seventh
Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students	Endocrinology ( Immunological Thyroid Diseases , Immunological Infertility and other	□ They are the effect of antibodies on thyroid gland functions. □ Understanding the impact of thyroid disorders on different body systems.  Analysis of drug and surgical treatments.	2	Twenty-eighth
Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students	Tumors and Tumor Markers	Understanding the relationship between the immune system and the development of tumors.  Analyzing the role of immunological markers in cancer diagnosis.  Studying the development of immunotherapies for cancer.	2	Twenty-ninth
Written Exams -(MCQ ( -2Case-Based Assessment Evaluation -3 through group discussions(Group Discussions & Debates) -4Oral Exams	The lecture was presented using PowerPoint, diagrams were used on the board, and a discussion was held with the .students	Graft versus host rejection and Transplantation	Studying methods of immune adaptation and improving the chances of successful transplantation.  Learn about the latest immunosuppressant drugs	2	thirty

. 1.1 Course Structure ( Practical Part )

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
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<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students</p>	<p>Rheumatoid Arthritis</p>	<p>Applying rheumatoid factor (RF) and CCP antibody tests in diagnosing the disease.</p>	<p><b>2</b></p>	<p>the first</p>
<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students</p>	<p>Systemic Lupus Erythmatosus</p>	<p>ANA ( antinuclear antibody) testing and interpreting the results.  <input type="checkbox"/> Analyzing kidney function tests in lupus patients to assess the progression of lupus nephritis.  <input type="checkbox"/> Clinically identifying skin rashes and mucosal ulcers in patients.  <input type="checkbox"/> UsingCRP andESR tests to monitor disease activity.</p>	<p><b>2</b></p>	<p>the second</p>
<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students</p>	<p>Ankylosing Spondylitis</p>	<p>HLA-B27 testing as an aid in diagnosis.</p>	<p><b>2</b></p>	<p>the third</p>
<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students</p>	<p>Sjogren's Syndrome</p>	<p>Using Schirmer's test to measure tear production.   Performing SS-A andSS-B antibody tests. Clinical assessment of dry mouth .and eyes</p>	<p><b>2</b></p>	<p>Fourth</p>

<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students</p>	<p>Behcet's Disease</p>	<p>performing a Pathergy Test to check for an overactive immune response.</p>	<p><b>2</b></p>	<p>Fifth</p>
<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students</p>	<p>Psoriatic Arthritis</p>	<p>identifying the skin signs of psoriasis and examining the nails..  <input type="checkbox"/> HLA-Cw6 test analysis in cases of psoriasis.</p>	<p><b>2</b></p>	<p>Sixth</p>
<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students</p>	<p>Gluten-sensitive enteropathy</p>	<p>tTG-IgA) . analysis</p>	<p><b>2</b></p>	<p>Seventh</p>
<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students</p>	<p>Pernicious Anemia</p>	<p>Analysis of vitaminB12 and folic acid levels.  <input type="checkbox"/> Performing a parietal cell antibody(PCA) test.  <input type="checkbox"/> Interpreting peripheral blood smear results for megaloblastic cells.</p>	<p><b>2</b></p>	<p>Eighth</p>

<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students</p>	<p>Diabetes mellitus</p>	<p>HbA1c blood glucose levels to assess disease control.  <input type="checkbox"/> Pancreatic antigen (GAD) antibodies.  <input type="checkbox"/> Interpreting the results of the oral glucose tolerance test(OGTT).</p>	<p><b>2</b></p>	<p>Ninth</p>
<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students</p>	<p>Ulcerative Colitis Crohn's Disease</p>	<p>Interpreting C- reactive protein(CRP) levels in monitoring disease activity</p>	<p><b>2</b></p>	<p>tenth</p>
<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students</p>	<p><i>Helicobacter pylori</i> Mucosa-associated lymphoid tissue lymphoma and <i>Helicobacter pylori</i> associated diseases</p>	<p>Analysis of fecal calprotectin levels as an indicator of inflammation.</p>	<p><b>2</b></p>	<p>eleventh</p>
<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students</p>	<p>And Autoimmune Hepatitis Autoimmune liver diseases</p>	<p>✓ Measurement of liver enzymes(ALT, AST, ALP, GGT) to detect autoimmune hepatitis.  ✓ Analysis of anti-smooth muscle antibodies(ASMA) and anti-liver and kidney antibodies(Anti-LKM).  ✓ Antinuclear antibody (ANA) test to diagnose .autoimmune hepatitis</p>	<p><b>2</b></p>	<p>twelfth</p>

<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted, and discussions were held with the students.</p>	<p>Primary Biliary Cirrhosis Primary Sclerosing Cholangitis</p>	<p>✓ Measure liver enzymes (ALP, GGT) which are elevated in cases of biliary cirrhosis. ✓ Analyze anti-mitochondrial antibodies (AMA) as a key diagnostic marker. ✓ Perform bilirubin and albumin tests to assess liver function deterioration.</p>	<p><b>2</b></p>	<p>thirteenth</p>
<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted, and discussions were held with the students.</p>	<p>Renal disease</p>	<p>✓ Creatinine and urea levels are analyzed to assess kidney function. ✓ Urine albumin (albuminuria) and proteinuria (proteinuria) levels are analyzed. ✓ Kidney biopsy is performed to detect immune and inflammatory changes. ✓ Anti-GBM antibodies are tested to detect autoimmune kidney diseases.</p>	<p><b>2</b></p>	<p>fourteenth</p>
<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted, and discussions were held with the students.</p>	<p>Circulating immune complex In situ immune complex formulation Antineutrophil Cytoplasmic Autoantibodies and associated diseases</p>	<p>Urine analysis to check for proteins and blood. <input type="checkbox"/> Electron microscopy of a kidney biopsy. <input type="checkbox"/> Blood analysis of creatinine and urea levels.</p>	<p><b>2</b></p>	<p>fifteenth</p>
<p><b>Formative Assessment</b> <b>Practical and clinical assessment</b></p> <p><b>Summative Assessment</b></p>	<p>The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted, and discussions were held with the students.</p>	<p>T Lymphocyte mediated Renal Injury Immunological Mediators in Acute inflammation</p>	<p>✓ Kidney function tests (serum creatinine, BUN, GFR) to assess the impact of T cells on kidney function. ✓ Urinalysis to detect proteins, blood, and white blood cells. ✓ Immunohistochemistry (IHC) to examine T cell infiltration in the kidney. ✓ Flow cytometry to identify T cell types</p>	<p><b>2</b></p>	<p>Sixteenth</p>

	with the .students		involved in kidney damage . ✓ Analysis of inflammatory cytokine levels(IL-2, TNF- $\alpha$ , IFN- $\gamma$ ) associated with immune kidney injury.		
<b>Formative Assessment Practical and clinical assessment  Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students	Primary glomerulonephritis)membranous glomerular nephritis (Nephrotic Syndrome)	ANA andAnti-dsDNA . analysis	<b>2</b>	seventeenth
<b>Formative Assessment Practical and clinical assessment  Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students	Post infection Glomerular nephritis IgA nephropathy	✓ Blood creatinine and urea levels are analyzed to assess kidney function. ✓ Proteinuria and hematuria are measured via urinalysis. ✓ Erythrocyte sedimentation rate(ESR) andCRP tests are performed to detect inflammation. ✓ Complement antibodies (C3, C4) are tested to assess the immune response.	<b>2</b>	eighteenth
<b>Formative Assessment Practical and clinical assessment  Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students	Lupus Nephritis Henoch-Schonlein Purpura	✓ Antinuclear antibody (ANA) and anti-dsDNA antibody tests for systemic lupus erythematosus (SLE (. ✓ Measurement of proteinuria and hematuria blood in the urine)) . ✓ Testing of complement levels(C3, C4) to detect excessive immune activity.	<b>2</b>	nineteenth
<b>Formative Assessment Practical and clinical assessment  Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on	Vasculitis-Associated Glomerular Lesion  Anti-Glomerular Basement Membrane Disease	ANCA analysis for diagnosing autoimmune vasculitis	<b>2</b>	Twenty

	the board, practical tests were conducted , and discussions were held with the .students				
<b>Formative Assessment Practical and clinical assessment  Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students	Respiratory Diseases Drug-induced Respiratory disease	<input type="checkbox"/> Lung function test (spirometry) to assess airflow. <input type="checkbox"/> Skin allergy test for various allergens. <input type="checkbox"/> BloodIgE level analysis .	<b>2</b>	Twenty-first
<b>Formative Assessment Practical and clinical assessment  Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students	Eosinophilic Pneumonias	<input type="checkbox"/> Analysis of eosinophil levels in blood and sputum . <input type="checkbox"/> Analysis of IgE levels .in blood	<b>2</b>	Twenty-second
<b>Formative Assessment Practical and clinical assessment  Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students	Occupational & Environmental lung Diseases	<input type="checkbox"/> Lung function test (spirometry) to assess airflow. <input type="checkbox"/> Skin allergy test for various allergens. <input type="checkbox"/> BloodIgE level analysis .	<b>2</b>	Twenty-third
<b>Formative Assessment Practical and clinical assessment  Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on the board,	Asthma	<input type="checkbox"/> Lung function test (spirometry) to assess airflow. <input type="checkbox"/> Skin allergy test for various allergens.	<b>2</b>	Twenty-fourth

	practical tests were conducted , and discussions were held with the .students		<input type="checkbox"/> BloodIgE level analysis .		
<b>Formative Assessment Practical and clinical assessment</b>  <b>Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students	Non-Allergic Bronchitis	<input checked="" type="checkbox"/> Perform a lung function test(Spirometry) <input checked="" type="checkbox"/> Identifying changes in chestX-rays to determine signs of inflammation. <input checked="" type="checkbox"/> Sputum analysis to detect bacterial or viral infections . <input checked="" type="checkbox"/> TestingC-reactive protein (CRP) and erythrocyte sedimentation rate(ESR) levels to detect chronic inflammation.	<b>2</b>	Twenty-fifth
<b>Formative Assessment Practical and clinical assessment</b>  <b>Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students	Hypersensitivity Diseases	<input checked="" type="checkbox"/> Perform skin prick tests (patch tests) to detect allergens. <input checked="" type="checkbox"/> Interpret IgE blood test results to determine excessive immune .response	<b>2</b>	Twenty-sixth
<b>Formative Assessment Practical and clinical assessment</b>  <b>Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students	Hemolytic anemia	<input checked="" type="checkbox"/> Perform a peripheral blood smear to detect abnormal or damaged red blood cells. <input checked="" type="checkbox"/> Test hemoglobin and hematocrit levels to assess the severity of anemia. <input checked="" type="checkbox"/> Use the direct and indirect Coombs test to diagnose hemolytic antibodies. <input checked="" type="checkbox"/> Measure indirect bilirubin and lactate dehydrogenase(LDH) levels as indicators of hemolysis. <input checked="" type="checkbox"/> Perform a reticulocyte count to assess bone marrow response.	<b>2</b>	Twenty-seventh

<b>Formative Assessment</b> <b>Practical and clinical assessment</b>  <b>Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students	Endocrinology ( Immunological Thyroid Diseases , Immunological Infertility and other	✓Measuring thyroid hormone levels(T3, T4, TSH) to diagnose autoimmune hypothyroidism or hyperthyroidism. ✓Analyzing thyroid antibodies(Anti-TPO, Anti-TG, TRAb) to detect autoimmune diseases such as Hashimoto's or Graves' disease.	<b>2</b>	Twenty-eighth
<b>Formative Assessment</b> <b>Practical and clinical assessment</b>  <b>Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students	Tumors and Tumor Markers	Analysis ofCA-125 ,CEA , andPSA levels for the diagnosis of various tumors	<b>2</b>	Twenty-ninth
<b>Formative Assessment</b> <b>Practical and clinical assessment</b>  <b>Summative Assessment</b>	The lecture was presented using PowerPoint, diagrams were used on the board, practical tests were conducted , and discussions were held with the .students	Graft versus host rejection and Transplantation	IdentifyingHLA tissue compatibility prior to transplantation.	<b>2</b>	thirty

### Course Evaluation .12





**.Daily exams, monthly and final theoretical and practical exams, and classroom discussions**


**Student Performance Analysis**

**Review by faculty members (Deanship)(Peer Review)**

**Comparison with similar courses(Benchmarking)**

### Learning and teaching resources .13

ministerial portfolio	Required textbooks (methodology)	
<p>"Kumar, Abbas, and Aster: Robbins and Cotran Pathologic Basis of Disease" ❖  Male D, Brostoff J, Roth DB, Roitt I. (2012). ❖  "Immunology". Elsevier ❖  Roitt's Essential Immunology ❖</p>	<p>Main references (sources)</p>	
<p>"Kumar, Abbas, and Aster: Robbins and Cotran Pathologic Basis of Disease" ❖  Male D, Brostoff J, Roth DB, Roitt I. (2012). ❖  "Immunology". Elsevier ❖  Roitt's Essential Immunology ❖</p> <p><b>Journal of Immunology (The American Association of Immunologists)</b>  - <a href="https://www.jimmunol.org">https://www.jimmunol.org</a></p> <p><b>Frontiers in Immunology</b> - ✓  <a href="https://www.frontiersin.org/journals/immunology">https://www.frontiersin.org/journals/immunology</a></p> <p><b>Autoimmunity Reviews (Elsevier)</b> - ✓  <a href="https://www.sciencedirect.com/journal/autoimmunity-reviews">https://www.sciencedirect.com/journal/autoimmunity-reviews</a></p> <p><b>Clinical &amp; Experimental Immunology (British Society for Immunology)</b> - ✓  <a href="https://academic.oup.com/cei">https://academic.oup.com/cei</a></p> <p><b>Kidney International (International Society of Nephrology)</b> - ✓  <a href="https://www.kidney-international.org">https://www.kidney-international.org</a></p>	<p>Recommended supporting books and references (scientific journals, reports, etc)</p>	
<p><b>Search in Medical and PubMed ( ) - Immunological Research</b>   <a href="https://pubmed.ncbi.nlm.nih.gov">https://pubmed.ncbi.nlm.nih.gov</a></p> <p><b>Scientific and Medical ScienceDirect ( Elsevier) - Publications from</b>   <a href="https://www.sciencedirect.com">https://www.sciencedirect.com</a></p> <p><b>a search engine for scientific Google Scholar ( ) - research and peer-reviewed journals</b>   <a href="https://scholar.google.com">https://scholar.google.com</a></p> <p><b>a network for researchers and ResearchGate ( ) - recent research papers</b>   <a href="https://www.researchgate.net">https://www.researchgate.net</a></p>	<p>Electronic references, websites</p>	

Recent Clinical Trials in Immunology • ClinicalTrials.gov (  ) - <a href="https://clinicaltrials.gov">https://clinicaltrials.gov</a> and Kidney Diseases		
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### Course description template

<b>1. Course Name</b>
Diagnostic bacteria
<b>2. Course code</b>
<b>3. Semester/Year</b>
6/2025 202
<b>4. Date of preparation of description</b>
11/26/2025
<b>5. Available forms of attendance</b>
Lecture in the classroom
<b>6. Number of hours (total) / Number of units (total)</b>
hours 6/ 4 units
<b>7. Name of course coordinator (if there is more than one, please list them): Name and university email</b>
Dr. Ali Musaher Atshan <a href="mailto:ali.m.atshan@nust.edu.iq">ali.m.atshan@nust.edu.iq</a>

## 8. Course objectives (subject matter objectives)

### 10. Course structure

ce, as w

.microbes In a correct and safe way

The course also covers methods for diagnosing microbes using traditional tests a  
.modern techniques, along with the study of diseases

.which causes Bacteria, methods of treatment and prevention

It also focuses on acquiring scientific skills and encouraging research-based thinking  
.understand behavior. microbes And to control it

## 9. Teaching and learning strategies

1. Theoretical education focuses on studying scientific problems in a purely scientific manner, aiming to understand the basis of the problem and to find solutions for it. Practical education provides practical experience in conducting experiments and research through the use of methods approved in conducting scientific .research
2. Theoretical and practical learning that relies on cooperation between the student and the professor, which leads to understanding the lesson as much as possible and overcoming obstacles that hinder the student's understanding or impede the .conduct of his experiments in the laboratory

He urged students to use books and scientific articles, whether library or .3  
.electronic, which help to enrich students scientifically

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Diagnostic microbiology: purpose and philosophy</b> <b>Laboratory safety</b>	The student applies basic laboratory safety procedures such as wearing personal protective equipment, sterilization, and	2	the first

			<p>safe disposal of waste.</p> <p>To apply best practices for handling microbial samples, such as collection, transport, and storage</p>		
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<p><b>Diagnostic microbiology: purpose and philosophy</b></p> <p><b>Laboratory safety</b></p>	<p>Explain the importance of quality and procedural control in obtaining accurate and reliable results</p>	2	the second
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<p><b>Selection, collection, and transport of specimens for microbiological examination</b></p>	<p>The student should evaluate the suitability of the sample sent to the laboratory for the required diagnostic purpose.</p> <p>To analyze common errors in sample collection and transportation and their impact on microbial results.</p> <p>To explain delayed transport or improper storage and how it affects microbial growth or survival</p>	2	the third
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<p><b>Selection, collection, and transport of specimens for microbiological examination</b></p>	<p>Applying biosafety practices during sample collection and transport</p>	2	Fourth
Daily exams and discussions	The lecture was presented via	<p><b>Cultivation and isolation of viable pathogens</b></p>	<p>The student should be able to apply inoculation techniques correctly and safely.</p>	2	Fifth

	PowerPoint and discussed with the .students		<p>To perform the stream plate method to isolate pure bacterial colonies.</p> <p>Use appropriate culture media according to the type .of pathogen expected</p>		
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Cultivation and isolation of viable pathogens</b>	<p>The student should choose the most appropriate culture medium based on clinical factors and the type of infection.</p> <p>To analyze the growth results on different media and interpret the differences in colony shape</p>	2	Sixth
Daily exams and discussions		<b>Microbiological methods for identification</b>	<p><b>Microscopic Examination</b></p> <ul style="list-style-type: none"> <li>• Agricultural methods(<b>Cultural Characteristics</b>)</li> <li>• Biochemical Tests</li> <li>• Serological Methods</li> <li>• <b>Molecular Identification</b> methods</li> </ul> <p>To describe the morphological and cultural characteristics that help in identifying pathogens</p>	2	Seventh
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Complementary diagnostic methods</b>	<p>The concept of supportive diagnostic methods and their role in supporting traditional microbial diagnosis.</p> <p>To distinguish between different types of support methods, such as:</p> <p><b>Serological tests</b></p> <p>To explain the scientific principle behind each method</p>	2	Eighth

			<p>and when it is used in diagnosis.</p> <p>To explain the features and limitations of each method, such as sensitivity and specificity.</p>		
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b>Normal flora and other opportunistic bacteria</b>	<p>Adherence to the ethics of handling biological samples and maintaining patient privacy.</p> <p><b>Applying</b> quality and biosafety rules in identifying normal flora and opportunistic pathogens.</p> <p>Be accurate and objective when reporting results that may be misinterpreted as an infection.</p> <p>Teamwork and effective communication within the laboratory environment</p>	2	Ninth
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b>Infections of the Eyes, Ears and Sinuses</b>	<p>It explains the mechanisms of infection and risk factors such as allergies, weakened immunity, and nasal ventilation problems.</p> <p>To explain the basic principles of collecting appropriate samples and diagnosing these infections in the laboratory</p>	2	tenth
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b>Bacterial infections of skin, soft tissues and wounds</b>	<p>Effective communication with the medical team to ensure accurate and comprehensive reports that aid in treatment</p>	2	eleventh
Daily exams and discussions	The lecture was presented via PowerPoint and	<b>Bacterial infections of skin, Burn</b>	<p>Explaining the basics of burn treatment, including first aid and advanced medical treatment</p>	2	twelfth

	discussed with the students				
Daily exams and discussions	The lecture was presented via PowerPoint and followed by discussion	<b>Diagnosis of bacterial respiratory tract infections (upper and lower RT)</b>	Learn about the types of bacterial respiratory infections and their common causes.  Distinguish between bacterial and viral infections based on symptoms and clinical examination.	2	thirteenth
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<b>Diagnosis of bacterial respiratory tract infections (upper and lower RT)</b>	Interpreting the results of laboratory and imaging tests to confirm the diagnosis.  Taking sputum samples or swabs correctly for laboratory testing.  Applying the principles of infection prevention and control and professional patient care	2	fourteenth
		<b>Exam</b>	Knowing the basic steps of clinical examination of patients.  Applying practical testing methods accurately and systematically.  Distinguish between normal and abnormal results.  Interpreting clinical signs and relating them to the possible medical condition.  Act professionally during the examination, taking into account the patient's safety and comfort	2	fifteenth

<b>11. Course evaluation</b>	
Daily exams, monthly and final theoretical and practical exams, and .classroom discussions	
<b>12. Learning and teaching resources</b>	
ministerial portfolio	Required textbooks (methodology, if applicable)
<p>Connie R. Mahon, Donald C. Lehman (2019): Textbook of Diagnostic Microbiology, Sixth Edition.</p> <p>Bailey &amp; Scott 's (2017): Diagnostic microbiology, fourteenth edition</p>	Main references (sources)
	Electronic references and websites

### Course description template

<b>1. Course Name</b>
Parasitology 1
<b>2. Course code</b>
<b>3. Semester/Year</b>
6/2025 202
<b>4. Date of preparation of description</b>
11/26/2025
<b>5. Available forms of attendance</b>

## Lecture in the classroom

### 10. Course structure

hours / 8 units 6

### 7. Name of course coordinator (if there is more than one, please list them): Name and university email

Dr. Ali Musaher Atshan [ali.m.atshan@nust.edu.iq](mailto:ali.m.atshan@nust.edu.iq)

### 8. Course objectives (subject matter objectives)

The student learns about the different types of medical parasites, their classification .sex, and studies their anatomical forms

And biological. It also identifies the cerebral diagnostic methods specific to ea .species, including serological and molecular methods

It studies the medical and pathological importance of the parasites prevalent in Ira .with a focus on the diseases associated with each species

### 9. Teaching and learning strategies

1. Theoretical education focuses on studying scientific problems in a purely scientific manner, aiming to understand the basis of the problem and to find solutions for it. Practical education provides practical experience in conducting experiments and research through the use of methods approved in conducting scientific .research
2. Theoretical and practical learning that relies on cooperation between the student and the professor, which leads to understanding the lesson as much as possible and overcoming obstacles that hinder the student's understanding or impede the .conduct of his experiments in the laboratory
3. He urged students to use books and scientific articles, whether library .or electronic, which help to enrich students scientifically

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b>Recent classification of parasite</b> <b>* Systematic grouping of parasites*</b> <b>General terms used in parasitology</b>	<p>Knowledge of the modern classification of parasites and their main systematic groups.</p> <p>the general terminology used in parasitology.</p> <p>Distinguishing between different types of parasites according to their scientific classification.</p> <p>Applying systematic concepts to identify parasites in theoretical or laboratory studies.</p> <p>Using precise scientific terminology when describing parasites.</p>	2	the first
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b>Protozoa</b> <b>* Collection and transport of specimens for enteric pathogens</b> <b>* Factors interfering for all types of stool collection</b> <b>* Precaution in the procedure of collection of specimens</b>	<p>Understanding the characteristics of common protozoa and intestinal parasites.</p> <p>Applying the correct methods for collecting and transporting stool samples.</p> <p>Identifying factors that may affect sample quality.</p> <p>Taking necessary precautions during sample collection to ensure safety and accuracy.</p>	2	the second
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b>Amoeba</b> <b>Entamoeba histolytica</b> <b>Examination of stool sample</b> a) Macroscopic examination of stool	<p>Knowing the diagnostic characteristics of the parasite <i>Entamoeba histolytica</i>.</p> <p>Applying macroscopic examination of stool to assess its overall appearance.</p> <p>Application of microscopic</p>	2	the third

		b) Microscopic examination of wet mounts	examination of wet mounts for parasite detection		
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<p><b>Preparation of solutions for wet mount; the advantages and disadvantages of each solution</b></p> <p>Saline solution</p> <p>Iodine solutions</p> <p>Eosin solution</p>	Follow laboratory safety procedures during sample collection and examination	<b>2</b>	Fourth
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<p><b>Pathogenic Free-Living Amoebae</b></p> <p><b>Naegleria Fowleri</b></p> <p><b>Differentiation of pathogenic <i>Entamoebahistolytica</i> and the morphologically identical non pathogenic <i>Entamoebadispar</i> using immunological assays</b></p> <p><b>Preparation of preservatives and fixatives for mounted slides</b></p> <p><b>Formalin solution (5-7%)</b></p> <p><b>* PVA (Polyvinyle alcohol) as fixative</b></p> <p><b>* Schaudinns fixative</b></p>	Applying immunological methods to differentiate between pathogenic and non-pathogenic parasites	<b>2</b>	Fifth
Daily exams and discussions	The lecture was presented via	<b>Intestinal; oral and genital flagellates</b>	Applying methods for collecting	<b>2</b>	Sixth

	PowerPoint and discussed with the .students	<b>Giardia lamblia</b> <b>Trichomonas vaginalis</b>	and examining laboratory samples to detect these parasites		
Daily exams and discussions		<b>Laboratory diagnosis of enteric protozoa</b>  * The routine methods used in laboratory diagnosis	Interpreting laboratory test results and relating them to the clinical condition.  Following safety procedures and proper laboratory practices during diagnosis	<b>2</b>	Seventh
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Laboratory diagnosis; routine methods, immunological Assays and molecular assays of parasite</b>	Distinguish between the advantages and disadvantages of each diagnostic method and determine the most suitable one for each type of .parasite	<b>2</b>	Eighth
Daily exams and discussions	The lecture was presented via PowerPoint	<b>Genus Leishmania</b>	Clarifying the characteristics of an ideal vaccine against parasites.	<b>2</b>	Ninth

	and discussed with the .students	<b>Properties of ideal vaccines. leishmania Vaccine in trail</b>	Understanding the latest developments and clinical trials for the <b>Leishmania vaccine</b> .  Assessing the feasibility of applying the vaccine at the practical and clinical levels		
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Phylum Apicomlexa; Main properties of the group, ultrastructure of the apical complex</b>  <b>First term examination</b>	It compares <b>Apicomplexa</b> with other parasitic phyla in terms of invasion mechanism and subcellular structure.	<b>2</b>	tenth
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Intestinal coccidian and <i>Cryptosporidium parvum</i></b>  <b>Morphology, habitat, mode of infection, infective stage, lifecycle and laboratory diagnosis with special emphasis on Ziehl-Neelsen technique</b>	Interpret the microscopic images and deduce the presence of the parasite based on the distinctive characteristics of the .oocyst	<b>2</b>	eleventh
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Extra-intestinal coccidian and <i>Toxoplasma gondii</i></b>	Explain the laboratory diagnostic methods: serological tests ( <b>ELISA, IFA</b> ) and the use of microscopic techniques to identify tissue morphology or oocytes.  • It links the morphological characteristics of the parasite to the	<b>2</b>	twelfth

			role of each stage in transmission and disease		
Daily exams and discussions	The lecture was presented via PowerPoint and followed by discussion	<b>ISOSPORA BELLI</b> <b>Morphology, habitat, mode of infection, infective stage, lifecycle and laboratory diagnosis</b>	It explains the methods of infection (ingestion of infectious oocysts from contaminated food (or water).  <ul style="list-style-type: none"> <li>• It identifies the infectious stage (<b>sporozoite</b> within the oocyte).</li> <li>• It explains the complete life cycle of the parasite, including the asexual and sexual stages within the small intestine</li> </ul>	<b>2</b>	thirteenth
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the students	<b>Cyclospora Cayetanensis</b> <b>Morphology, habitat, mode of infection, infective stage, lifecycle and laboratory diagnosis</b>	It explains the life cycle of the parasite, including the asexual and sexual stages within the small intestine.  skills or applications  <ul style="list-style-type: none"> <li>• Explains the steps of laboratory diagnosis: stool examination using <b>Modified Acid Fast staining</b>, fluorescence(<b>UV</b>) <b>assay</b> to identify oseltamivir</li> </ul>	<b>2</b>	fourteenth
Daily exams and discussions	The lecture was presented via PowerPoint and discussed	<b>Sarcocystis hominis</b> <b>Morphology, habitat, mode of infection, infective stage, lifecycle and laboratory diagnosis</b>	Explain the steps of laboratory diagnosis: stool examination to detect oocysts, and tissue examination to detect <b>sarcocysts</b> in muscles.  <ul style="list-style-type: none"> <li>• He interprets microscopic images and infers the</li> </ul>	<b>2</b>	fifteenth

	with the .students		presence of the parasite based on the distinctive characteristics of .each stage		
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<b>11. Course evaluation</b>	
Daily exams, monthly and final theoretical and practical exams, and .classroom discussions	
<b>12. Learning and teaching resources</b>	
<b>Paniker's Textbook of Medical Parasitology</b>	Required textbooks (methodology, if applicable)
	Main references (sources)
	Electronic references and websites

<b>21. Methods of scientific research :Course name</b>
Course Name (Subject)
<b>22. : Course code</b>
<b>23. :Semester/Year2025-2026</b>
<b>24. :Date this description was prepared21 / 105 202/</b>
<b>25. : Available attendance formats</b>
Lecture in the classroom

<b>26. : Number of study hours (total) / Number of units (total)</b>					
hour theory / Number of units: 1 1					
<b>27. Name of the course coordinator (if there is more than one, please state) : M. M. Hamza Maleh Dakh</b>					
Hamzamaleh27@gmail.com			(Theoretical aspect)		
<b>28. Course Objectives</b>					
<b>General objective: Informing the student about how .to write and conduct research</b>  <b>Specific objective: So that by the end of the semester the student will be able to design and write a scientific research paper</b>			<b>Course Objectives</b>		
<b>29. : Learning and teaching strategies</b>					
<b>30. Course structure (theoretical part)</b>					
<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
		Principles of research	<i>Evaluate the credibility of published research studies based on study design, data collection methods, and analysis.</i> <ul style="list-style-type: none"> <li>• <i>He compares quantitative and qualitative research methods and chooses the most appropriate one according to the nature of the research problem.</i></li> <li>• <i>It suggests improvements to the research design or data collection methods to ensure more . accurate and reliable results</i></li> </ul>	1	the first

		Scientific method.	<p><i>Observing the phenomenon or problem.</i></p> <p><i>Formulating the research question or problem.</i></p> <p><i>Gathering information and previous references.</i></p> <p><i>Formulating testable hypotheses.</i></p> <p><i>Designing experiments or studies to collect data.</i></p> <p><i>Data analysis and conclusion drawing.</i></p> <p><i>Check the results and repeat the experiment if necessary.</i></p> <ul style="list-style-type: none"> <li><i>Explains the relationship between the hypothesis, the variables, and the experiment</i></li> </ul>	1	the second
		Designing the research plane.	<p><i>In short, the student will be able to define, explain, apply, and evaluate the design of a research plan in a practical and .professional manner</i></p>	1	the third
		The research process.	<p><i>It assesses the quality of the research, the accuracy of its results, and its reproducibility.</i></p> <ul style="list-style-type: none"> <li><i>He compares different research methods and chooses the most appropriate one according to the nature of the .scientific problem</i></li> </ul>	1	Fourth
		Classification of research.	<p><i>For practical skills or applications</i></p> <ul style="list-style-type: none"> <li><i>It classifies a specific research problem or question within the appropriate research type.</i></li> <li><i>He chooses the methodology and data collection tools according to the type of research.</i></li> </ul> <p><i>Evaluation and Composition</i></p> <ul style="list-style-type: none"> <li><i>Evaluates the suitability of the chosen research type for achieving the study objectives</i></li> </ul>	1	Fifth
		Fundamental research	<p><i>It assesses the contribution of basic research to</i></p>	1	Sixth

			<i>scientific and intellectual progress</i>		
		Applied research and pilot study	<i>It explains the role of a preliminary pilot study in testing research design, data collection tools, and analysis methods before conducting actual research</i>	1	Seventh
		Clinical trial research.	<i>It explains the steps of clinical research design: sample selection, group division (experimental and control), identifying variables, and selecting measurement methods.</i>  <ul style="list-style-type: none"> <li><i>Explains the importance of ethical standards, informed consent, and ensuring the safety of trial participants</i></li> </ul>	1	Eighth
		Research problem formation.	<i>It explains the relationship between the research problem, the study objectives, and the research questions.</i>  <ul style="list-style-type: none"> <li><i>It defines the criteria for selecting a good research problem: researchable, specific, measurable, and scientifically or practically important</i></li> </ul>	1	Ninth
		Proposal writing (protocol).	<i>The quality of the research proposal is evaluated in terms of the clarity of the problem, feasibility, and accuracy of the methodology.</i>  <ul style="list-style-type: none"> <li><i>It compares different research proposals and identifies the strengths and weaknesses of each</i></li> </ul>	1	tenth
		Introduction (chapter one) and aim of the study.	<i>The quality of the research proposal is evaluated in terms of the clarity of the problem, feasibility, and accuracy of the methodology.</i>  <ul style="list-style-type: none"> <li><i>It compares different research</i></li> </ul>	1	eleventh

			<i>proposals and identifies the strengths and weaknesses of each</i>		
		Review of literature	<p><i>He gathers and analyzes literature relevant to the research problem.</i></p> <ul style="list-style-type: none"> <li><i>He summarizes and compares previous studies in a critical and systematic way.</i></li> <li><i>It links the results of previous studies with the research problem at hand</i></li> </ul>	1	twelfth
		Result.	<p><i>It displays the results using tables, graphs, and charts in a clear and accurate manner.</i></p> <ul style="list-style-type: none"> <li><i>Appropriate statistical analysis is applied to the data and its interpretation is correct.</i></li> <li><i>Links the results to the hypotheses to determine the extent to which they are confirmed or refuted</i></li> </ul>	1	thirteenth
		Discussion.	<p><i>It compares different methods of discussing results and chooses the most appropriate method for each research.</i></p> <ul style="list-style-type: none"> <li><i>It suggests future research directions based on study results and research gaps</i></li> </ul>	1	fourteenth
		Conclusion and recommendation	<p><i>A clear and comprehensive conclusion that objectively reflects the research findings.</i></p> <ul style="list-style-type: none"> <li><i>It makes actionable recommendations based on the study results and research gaps.</i></li> <li><i>It links the conclusions to the hypotheses and research</i></li> </ul>	1	fifteenth

			<i>objectives in a logical .manner</i>		
<b>Course Evaluation .12</b>					
<b>Learning and teaching resources .13</b>					
1- <a href="http://www.socscidiss.bham.ac.uk/methodologies.html">http://www.socscidiss.bham.ac.uk/methodologies.html</a>					
2- <a href="https://www.slideshare.net/collinsbrobbey/sample-study">https://www.slideshare.net/collinsbrobbey/sample-study</a>					

## Course description template

<b>1. Pathology :Course Name</b>
<b>2. : Course code</b>

<b>3. Semester/Year: 2025-2026</b>	
<b>4. Date this description was prepared: 4/11/2025</b>	
<b>5. Available forms of attendance : Theoretical lecture in the classroom</b>	
<b>6. Total study hours/total units : 30 hours (one course) / 4 units</b>	
<b>7. : Name of the course coordinator (if there is more than one, please state)</b>	
:Email	Dr. Ali Hussein Sabih Al-Ibrahim
<b>8. Course Objectives</b>	
<input type="checkbox"/> <b>Understanding the nature of the disease:</b> Introducing the student to the concept of disease, its causes, types, and contributing factors.  <input type="checkbox"/> <b>Linking Cellular and Clinical Changes:</b> Clarifying the relationship between microscopic changes in cells and tissues and clinical symptoms and signs.  <input type="checkbox"/> <b>Building the scientific basis for diagnosis and treatment:</b> Providing the student with the knowledge that enables him to understand how to diagnose diseases and plan their treatment.  <input type="checkbox"/> <b>Enhancing clinical analytical thinking:</b> Training the student to analyze disease cases and understand their pathogenesis mechanisms.  <input type="checkbox"/> <b>Developing observation and interpretation skills:</b> Enabling the student to interpret the results of laboratory tests and histological and morphological changes  .	<b>Course Objectives</b>

## 9. : Learning and teaching strategies

- Delivering the lecture using PowerPoint and explanatory videos .1  
related to the devices, how the device works, and how to handle,  
.operate, and maintain it
- Identifying and teaching the use of medical equipment in .2  
laboratories
- Continuous discussion through asking and answering questions .3  
within the hall and motivating the student to think for himself and  
.thus to learn for himself
- Using educational tools such as scientific images makes the .4  
.material more accessible to students
- Students were urged to use books and scientific articles, whether .5  
physical or electronic, as they greatly help in retaining information  
.and allow for discussion and conclusions

## 10. Course structure (theoretical part)

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b>The role of pathology in the age of precision medicine</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Explaining the concept of precision medicine and the role of pathology within it.</li> <li><input type="checkbox"/> Identifying the molecular and genetic tests used in accurate diagnosis.</li> <li><input type="checkbox"/> Linking pathological changes to genetic markers and targeted therapy.</li> </ul>	2	the first

			<input type="checkbox"/> Recognizing the importance of collaboration between pathologists and physicians to achieve accurate healthcare.		
Daily exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Dissolutions</b>	<input type="checkbox"/> Definition of the concept of <b>cell degeneration</b> And its types. <input type="checkbox"/> Describe <b>the morphological and microscopic characteristics</b> of the different forms of decomposition. <input type="checkbox"/> Explaining <b>the mechanisms that cause</b> these pathological changes. <input type="checkbox"/> Distinguishing between <b>reversible and irreversible decomposition</b> . <input type="checkbox"/> Linking tissue changes <b>to the clinical manifestations</b> of diseases	2	the second
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Chronic obstructive pulmonary disease and lung cancer</b>	<input type="checkbox"/> <input type="checkbox"/> Definition of <b>chronic obstructive pulmonary disease (COPD)</b> And <b>lung cancer</b> . <input type="checkbox"/> Explanation of <b>the mechanisms of pathogenesis</b> Leading each of them. <input type="checkbox"/> Distinguishing <b>the histological and microscopic characteristics</b> in case of emphysema,	2	the third

			<p>bronchitis and lung cancer.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Identifying <b>the causative factors</b> , especially smoking and environmental factors</li> <li><input type="checkbox"/> Linking pathological changes <b>to clinical manifestations</b> such as shortness of breath and chronic cough.</li> </ul>		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Inflammatory diseases of the digestive system</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Definition of <b>inflammatory disease of the digestive system</b> and their main types.</li> <li><input type="checkbox"/> Describe <b>the pathological mechanisms</b> causing acute and chronic inflammation in the digestive system.</li> <li><input type="checkbox"/> Distinguishing <b>the histological and microscopic characteristics</b> of each type of inflammation.</li> <li><input type="checkbox"/> Identifying <b>the causative factors</b> , including infection, autoimmunity, and environmental factors</li> <li><input type="checkbox"/> Linking pathological changes <b>to clinical manifestations</b> such as pain, diarrhea, and intestinal bleeding</li> </ul>	2	Fourth

Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<p style="text-align: center;"><b>Tumor diseases of the digestive system</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <input type="checkbox"/> Neoplasms ( <b>Tumor</b> Reefs) And th types in the digestive system.</li> <li><input type="checkbox"/> Distinguishing between <b>benign and malignant tumors</b> in terms of histological and behavioral characteristics.</li> <li><input type="checkbox"/> Explaining <b>the molecular and pathological mechanisms</b> of cancer formation in the digestive system.</li> <li><input type="checkbox"/> Identifying <b>the causative factors</b> such as genetic factors, nutrition, and chronic gastrointestinal infections.</li> <li><input type="checkbox"/> Linking pathological changes <b>to clinical manifestations</b> such as bleeding, anemia, or intestinal obstruction.</li> </ul>	2	Fifth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<p style="text-align: center;"><b>Liver cirrhosis, hepatocellular carcinoma, and gallbladder disease</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Definition and diagnosis of <b>liver cirrhosis</b> , its causes and complications.</li> <li><input type="checkbox"/> Explaining the relationship between <b>cirrhosis and hepatocellular carcinoma</b>.</li> <li><input type="checkbox"/> Description of <b>the histological and microscopic characteristics</b> of liver cirrhosis and hepatocellular carcinoma.</li> <li><input type="checkbox"/> Identifying <b>common gallbladder diseases</b> , their causes and</li> </ul>	2	Sixth

			<p>pathological consequences.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Linking pathological changes <b>to clinical manifestations</b> such as jaundice, abdominal pain, and hepatomegal</li> </ul>		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<p><b>Primary glomerulonephritis and diseases of the renal tubules and interstitial tissue</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Definition of <b>primary glomerulonephritis</b> and its different types.</li> <li><input type="checkbox"/> Explanation of <b>the immune and pathological mechanisms</b> that cause glomerulonephritis.</li> <li><input type="checkbox"/> Distinguishing <b>the histological and microscopic characteristics</b> of glomerulonephritis, tubular diseases, and renal interstitials.</li> <li><input type="checkbox"/> Describe <b>the factors that cause</b> tubular and interstitial diseases (such as drugs, infections, and (toxins).</li> <li><input type="checkbox"/> Linking pathological changes <b>to clinical manifestations</b> such as proteinuria, hematuria, kidney failure.</li> </ul>	2	Seventh
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<p><b>Endometrial, placental, and cervical diseases</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Identifying the main types of diseases of <b>the endometrium, placenta and cervix.</b></li> <li><input type="checkbox"/> Explaining <b>the pathological and hormonal mechanisms</b> that cause hyperplasia and endometrial cancer.</li> <li><input type="checkbox"/> Describe <b>the histological and microscopic characteristics</b> of inflammatory and</li> </ul>	2	Eighth

			<p>neoplastic diseases in these organs.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Identifying <b>the causative factors</b> such as hormonal disorders, infections, and <b>HPV virus</b>.</li> <li><input type="checkbox"/> Linking pathological changes <b>to clinical manifestations</b> such as uterine bleeding, infertility, and pregnancy complications.</li> </ul>		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b>breast tumors</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <input type="checkbox"/> <b>Breast diseases</b> are classified into infections, benign changes, and malignant tumors.</li> <li><input type="checkbox"/> Describe <b>the pathological mechanisms</b> and histological characteristics of each of these disorders.</li> <li><input type="checkbox"/> Identifying <b>the factors that cause</b> breast cancer and the protective factors.</li> <li><input type="checkbox"/> Linking pathological changes <b>to clinical manifestations</b> such as mass, pain, and discharge.</li> </ul>	2	Ninth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b>Oncological and non-oncological diseases of the ovary</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <input type="checkbox"/> Distinguishing between <b>neoplastic and non-neoplastic ovarian diseases</b>.</li> <li><input type="checkbox"/> Describe <b>the pathological and hormonal mechanisms</b> causing each type.</li> <li><input type="checkbox"/> Determining <b>the histological and microscopic characteristics</b> of</li> </ul>	2	tenth

			<p>benign and malignant ovarian tumors.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Identifying <b>the causative and predisposing factors</b> such as age, hormones and genetic factors.</li> <li><input type="checkbox"/> Linking pathological changes <b>to clinical manifestations</b> such as menstrual irregularities, infertility, or the presence of a mass in the . pelvis</li> </ul>		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the .students	<b>Meningitis and tumors of the central nervous system</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Definition of <b>meningitis</b> , its different types, and the causes of each type</li> <li><input type="checkbox"/> Describe <b>the inflammatory mechanisms</b> that affect the meninges and the central nervous system.</li> <li><input type="checkbox"/> Distinguishing between <b>histological and laboratory characteristics</b> in cases of bacterial and viral inflammation.</li> <li><input type="checkbox"/> Identifying <b>the types of tumors of the central nervous system</b> and the source of each.</li> <li><input type="checkbox"/> Interpretation of <b>the histological and clinical changes</b> associated with neuroblastomas.</li> <li><input type="checkbox"/> Linking neurologic symptoms to pathological changes in the meninges or brain tissue</li> </ul>	2	eleventh

Exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<p style="text-align: center;"><b>Oncological and non-oncological skin diseases</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Distinguishing between <b>neoplastic and non-neoplastic skin diseases</b>.</li> <li><input type="checkbox"/> Describe <b>the inflammatory and immune mechanisms</b> that cause non-tumor skin diseases.</li> <li><input type="checkbox"/> Determining <b>the histological and microscopic characteristics</b> of the most important benign and malignant skin tumors.</li> <li><input type="checkbox"/> Identifying <b>the causative and predisposing factors</b> such as sun exposure and genetic factors.</li> <li><input type="checkbox"/> Linking <b>clinical manifestations to pathological changes</b> such as rash, ulceration or pigmentation</li> </ul> <p>It identifies the advantages and disadvantages of autoclaves.</p>	2	twelfth
Exams and discussions	The lecture was presented via PowerPoint and followed by discussion.	<p style="text-align: center;"><b>Thyroid diseases</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Identifying the main types of <b>thyroid disease</b> ( Functional, inflammatory, neoplastic).</li> <li><input type="checkbox"/> Describe <b>the pathological and hormonal mechanisms</b> that cause hyperactivity or deficiency.</li> <li><input type="checkbox"/> Identifying <b>the histological and microscopic characteristics</b> of the most important disorders.</li> </ul>	2	thirteenth

			<input type="checkbox"/> Linking <b>clinical signs</b> to pathological changes in the gland. <input type="checkbox"/> Differentiating between <b>benign and malignant tumors</b> in terms of histological and clinical behavior		
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b>soft tissue tumors</b>	<input type="checkbox"/> Classification of <b>soft tissue tumors</b> into benign and malignant. <input type="checkbox"/> Describe <b>the tissue origin</b> and morphological characteristics of each species. <input type="checkbox"/> Distinguishing <b>the microscopic characteristics</b> that differentiate between benign tumors and sarcomas. <input type="checkbox"/> Identifying <b>the factors that cause and predispose</b> to the development of tumors (genetic or radiation). <input type="checkbox"/> Linking <b>clinical signs</b> to histological changes in the brain	2	fourteenth
Exams and discussions	The lecture was presented via PowerPoint and discussed with the students.	<b>Osteomyelitis and bone tumors</b>	<input type="checkbox"/> Definition of <b>osteomyelitis</b> , its types and bacterial causes. <input type="checkbox"/> Description of <b>pathological and microscopic changes</b> in acute and chronic inflammation. <input type="checkbox"/> <b>Bone tumors</b> are classified as benign or malignant. <input type="checkbox"/> Determining <b>the histological and microscopic</b>	2	fifteenth

			<b>characteristics</b> of each type of bone tumor.  <input type="checkbox"/> Linking <b>clinical and radiographic signs</b> to pathological changes in the bones.		
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**Course Evaluation .12**

Daily exams, monthly and final theoretical and practical exams, and classroom .discussions

General and transferable skills (other skills related to employability and -1 .(personal development

The student acquired general skills through practical experience in collecting -2 .pathological samples and methods of handling them

Self-development through keeping up with the latest developments in the -3 field of specialization and contributing to and participating in training courses, . lectures and scientific seminars prepared for this purpose

**Learning and teaching resources .13**

	<b>Required textbood (methodology)</b>	
	<b>Main references (sources)</b>	
<input type="checkbox"/> <b>References:-</b>  <b>Pathologic basis of diseases, 8th<sup>edition</sup> , 2012</b> - <b>Junqueira's basic histology, 15th<sup>edition</sup> , 2018</b> - <b>Pathology illustrated, 17th<sup>edition</sup> , 2011.</b> - <b>Robbins, Stanley (2010). Robbins and Cotran pathologic basis of disease (8th ed.). Philadelphia: Saunders/Elsevier.</b> -	<b>Recommended supporting books and references (scientific (.journals, reports, etc</b>	
	<b>,Electronic references</b>  <b>Internet sites</b>	



<b>:Course name .1</b>
<b>Hematology</b>
<b>Course code .2</b>
<b>Semester/Year .3</b>
<b>Chapters 1 and 2 for the year 2025-2026</b>
<b>Date of preparation of description .4</b>
<b>:Available forms of attendance .5</b>
<b>My presence</b>
<b>Number of hours (total) / Number of units (total) .6</b>
<b>hours of theory + 2 hours of practical work = 4 hours per week 2</b>
<b>Name of course coordinator (if there is more than one, please .7 list them): Name and university email</b>
<b>Riyadh Eidan Abdul Email: riyad.edanabed@nust.edu.iq</b>
<b>Course objectives (subject matter objectives) .8</b>
<b>Understanding the history of hematology .1</b>
<b>Understanding blood composition .2</b>
<b>Knowing the limits Natural and unnatural components .3 of blood</b>
<b>Identifying the most important blood disorders and .4 methods of diagnosing them</b>
<b>Identifying the changes caused by blood-related diseases .5</b>

**Direct teaching: Delivering information from the -1 professor to the students through lectures, presentations, .and the blackboard**

**Cooperative learning: through working in groups to -2 .complete scientific reports and solve problems**

**Blended learning: which combines in-person and online -3 .lessons through special applications**

**Problem-based learning: Presenting real-life problems to -4 .students and asking them to solve them**

**Discovery learning: Encouraging students to explore and -5 discover knowledge on their own through research and .experimentation**

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Definition, ) importance, general functions of (blood</b>	<b>Introduction to Hematology</b>	<b>2</b>	<b>the first</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Red blood cell formation, red blood cell morphology, red blood cell cell membrane, and red blood cell metabolism</b>	<b>Blood formation</b>	<b>4</b>	<b>Second and third</b>

Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Composition, ) structure, and levels in the blood and in (red blood cells</b>	<b>hemoglobin</b>	<b>2</b>	<b>Fourth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Definition, ) causes, (classification</b>	<b>anemia</b>	<b>2</b>	<b>Fifth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Iron deficiency anemia</b>	<b>Iron metabolism</b>	<b>2</b>	<b>Sixth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Megaloblastic anemia vitamin B12 ) deficiency, causes and diagnosis) and pernicious anemia</b>	<b>Megaloblastic anemia vitamin B12 ) deficiency, causes and diagnosis) and pernicious anemia</b>	<b>2</b>	<b>Seventh</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Folic acid deficiency causes and ) (diagnosis</b>	<b>Folic acid deficiency causes and ) (diagnosis</b>	<b>2</b>	<b>Eighth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>hemolytic anemia</b>	<b>hemolytic anemia</b>	<b>4</b>	<b>The ninth and tenth</b>

Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Definitions, ) Types, Causes (and Diagnosis</b>	<b>Thalassemia</b>	<b>2</b>	<b>eleventh</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>sickle cell anemia</b>	<b>sickle cell anemia</b>	<b>2</b>	<b>twelfth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>aplastic anemia</b>	<b>aplastic anemia</b>	<b>2</b>	<b>thirteenth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>polycythemia</b>	<b>polycythemia</b>	<b>2</b>	<b>fourteenth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations		<b>Material review</b>	<b>2</b>	<b>fifteenth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Classification ) and general functions of (each</b>	<b>white blood cells</b>	<b>2</b>	<b>Chapter Two, Week Sixteen , Seventh ten</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Neutrophilia, ) neutropenia, eosinophilia,</b>	<b>Non- malignant white blood cell diseases</b>	<b>2</b>	<b>Week 18</b>

learning		<b>eosinophilia, (mononucleosis</b>			
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>lymphocyte disorders</b>	<b>lymphocyte disorders</b>	<b>2</b>	<b>Week 19</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Leukemia: ) Definition, Types, Classification, Causes, Leukemia (Reactions</b>	<b>Non- malignant white blood cell diseases</b>	<b>2</b>	<b>Week 20</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Acute ) lymphocytic leukemia, acute myeloid leukemia) Causes and diagnosis of each</b>	<b>acute leukemia</b>	<b>2</b>	<b>Week 21</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Chronic lymphocytic leukemia (CLL) and chronic myeloid leukemia (CML): Causes and diagnosis of .each</b>	<b>chronic leukemia</b>	<b>2</b>	<b>Week 22</b>
Visual .1 learning Auditory .2	Exams and .1 . tests Short tests .2	<b>Hodgkin ) lymphoma,</b>	<b>lymphoma</b>	<b>2</b>	<b>Week 23</b>

learning Self-learning .3 Experiential .4 learning	Duties .3 Practical .4 Examinations	<b>causes, laboratory (results</b>			
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Non-Hodgkin lymphoma: causes and laboratory findings</b>	<b>Non-Hodgkin lymphoma: causes and laboratory findings</b>	<b>2</b>	<b>Week 24</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>General form ) (and functions</b>	<b>platelets</b>	<b>2</b>	<b>Week 25</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Stop the bleeding</b>	<b>Stop the bleeding</b>	<b>2</b>	<b>Week 26</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Bleeding disorders</b>	<b>Bleeding disorders</b>	<b>4</b>	<b>Week 27 + Twenty- eighth</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations	<b>Arterial thrombosis, venous thrombosis, and risk factors</b>	<b>Arterial thrombosis, venous thrombosis, and risk factors</b>	<b>4</b>	<b>Week 29</b>
Visual .1 learning Auditory .2 learning Self-learning .3 Experiential .4 learning	Exams and .1 . tests Short tests .2 Duties .3 Practical .4 Examinations		<b>Material review</b>	<b>2</b>	<b>Week 30</b>

<b>Course evaluation .11</b>	
<p><b>The grade is distributed out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral .and written exams, reports, etc</b></p> <p><b>:Midterm grade = 40 points from</b></p> <p><b>marks for the theory exam + 5 marks for the tests and 20 .1 .presentations</b></p> <p><b>marks for the practical exam + 5 marks for tests and 5 10 .2 .marks for reports and attendance</b></p> <p><b>.Final grades = 60 come from the final theoretical exam</b></p> <p><b>Total score = 100</b></p>	
<b>Learning and teaching resources .12</b>	
	<b>Required textbooks (methodology, if applicable)</b>
<b>Hematology: Basic Principles and Practice, 7th Edition.</b>	<b>Main references (sources)</b>

<b>Hoffbrand's Essential Haematology 8th Edition</b>	
	<b>Electronic references and websites</b>



<b>Course Name (Subject)</b>	
<b>32. : Course code</b>	
<b>33. :Semester/Year2025-2026</b>	
<b>34. Date this description was prepared : 15/9/2025</b>	
<b>35. : Available attendance formats</b>	
<b>Lecture in the classroom</b>	
<b>36. : Number of study hours (total) / Number of units (total)</b>	
<b>hours of theory / Number of units: 2 2</b>	
<b>37. Name of the course coordinator (if there is more than one, please state) : M. M. Hamza Maleh Dakh</b>	
<b>Hamzamaleh27@gmail.com</b>	<b>(Theoretical aspect)</b>
<b>38. Course Objectives</b>	
<p><b>General Objective : To learn about stem cells, their types, characteristics, and role in the medical field; to learn about embryology, the transformation of germ cells into male or female, the stages of embryonic development, and the diagnosis of fetal .abnormalities before birth</b></p> <p><b>Specific objective: That the student will be able to, ,by the end of the semester</b></p> <p><b>Recognizes the characteristics of stem cells and -1 lists the origin of stem cell formation</b></p> <p><b>The student learns about the growth and -2 differentiation of stem cells and distinguishes the .different applications of stem cell uses</b></p> <p><b>The student learns about how the male and -3 female gametes develop and transform into a male .or female</b></p>	<b>Course Objectives</b>

<p><b>Studying the development of ovulation, the -4 method of germination, and the weekly stages of .embryonic growth</b></p> <p><b>Learning how to diagnose congenital defects -5 .before birth</b></p>	
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**39. : Learning and teaching strategies**

**40. Course structure (theoretical part)**

<b>Evaluation Method</b>	<b>Learning method</b>	<b>Unit or topic name</b>	<b>Required learning outcomes</b>	<b>Hours</b>	<b>Week</b>
<ul style="list-style-type: none"> <li>• Multiple-choice questions about the basic concept of stem cells.</li> <li>• A short activity in which the student is asked to write a definition of stem cells.</li> <li>• A quick oral assessment to ensure the student understands the key points in the introduction.</li> <li>• A slide presentation that includes illustrations of differentiation ability levels (Totipotent vs Pluripotent).</li> </ul>	<ul style="list-style-type: none"> <li>• A visual presentation explaining the basics of stem cells with examples.</li> <li>• A classroom discussion designed to stimulate thinking about the role of stem cells .</li> <li>• Watch a short educational video explaining</li> </ul>	<p>Introduction, what are stem cells</p> <p>-What are the Properties of Stem Cells that Make Them Different from Other Cells?</p>	<ul style="list-style-type: none"> <li>• The student defines the concept of stem cells in a scientific and accurate manner.</li> <li>• The student distinguishes between stem cells and other cell types in the body.</li> <li>• The student explains the importance of studying stem cells in medical and research applications.</li> </ul>	1	the first

<ul style="list-style-type: none"> <li>• A group activity in which students arrange the stages of embryonic development and identify which stage contains each type of ability.</li> <li>• Watch a short video explaining the origin of embryonic stem cells and how they are isolated in the laboratory.</li> </ul>	<p>what stem cells are and how they were first discovered .</p>				
<ul style="list-style-type: none"> <li>• A slide presentation that includes illustrations of differentiation ability levels (Totipotent vs Pluripotent).</li> <li>• A group activity in which students arrange the stages of embryonic development and identify which stage contains each type of ability.</li> <li>• Watch a short video explaining the origin of embryonic stem cells and how they are isolated in the laboratory.</li> </ul>		<p>-Totipotency and Pluripotency, and Embryonic Stem Cells</p> <p>-Multipotency, Unipotency, and Adult Stem Cells</p>	<ul style="list-style-type: none"> <li>• The student explains the concept of <b>totipotency</b>. Pluripotency The scientific difference between them.</li> <li>• The student defines <b>embryonic stem cells</b>. Its source is identified.</li> <li>• The student explains the relationship between the differentiating abilities of embryonic stem cells and their developmental characteristics.</li> </ul>	1	the second
<ul style="list-style-type: none"> <li>• Multiple-choice questions about the basic concept of stem cells.</li> <li>• A short activity in which the student is asked to write a</li> </ul>	<ul style="list-style-type: none"> <li>• A visual presentation explaining the basics of stem</li> </ul>	<p>- Cell Division and Aging: The Role of Telomerase</p> <p>-The Relationship Between Cell Division and</p>	<ul style="list-style-type: none"> <li>• The student explains the role of telomeres in cell division and aging.</li> <li>• The student explains the function of the</li> </ul>	1	the third

<p>definition of stem cells.</p> <ul style="list-style-type: none"> <li>• A quick oral assessment to ensure the student understands the key points in the introduction.</li> <li>• A slide presentation that includes illustrations of differentiation ability levels (Totipotent vs Pluripotent).</li> <li>• A group activity in which students arrange the stages of embryonic development and identify which stage contains each type of ability.</li> <li>• Watch a short video explaining the origin of embryonic stem cells and how they are isolated in the laboratory.</li> </ul>	<p>cells with examples.</p> <ul style="list-style-type: none"> <li>• A classroom discussion designed to stimulate thinking about the role of stem cells .</li> <li>• Watch a short educational video explaining what stem cells are and how they were first discovered .</li> </ul>	<p>Differentiation: Epigenetics</p> <p>Epigenetics in Stem Cells</p>	<p>telomerase enzyme in protecting telomeres.</p> <ul style="list-style-type: none"> <li>• The student analyzes the relationship between telomere shortening and the deterioration of cell function with age.</li> </ul>		
		<p>Characterizing of stem cells, Origins and Types of Stem Cells: What's in a Name?</p> <p>Pluripotent Stem Cells</p>	<ul style="list-style-type: none"> <li>• The student explains the scientific criteria used to characterize stem cells, such as the ability to self-renew and differentiate.</li> <li>• The student distinguishes between common laboratory tests for determining the characteristics of stem cells.</li> <li>• The student explains how molecular markers</li> </ul>	1	Fourth

			are used to identify stem cells.		
<ul style="list-style-type: none"> <li>• Multiple-choice questions about the basic concept of stem cells.</li> <li>• A short activity in which the student is asked to write a definition of stem cells.</li> <li>• A quick oral assessment to ensure the student understands the key points in the introduction.</li> <li>• A slide presentation that includes illustrations of differentiation ability levels (Totipotent vs Pluripotent).</li> <li>• A group activity in which students arrange the stages of embryonic development and identify which stage contains each type of ability.</li> <li>• Watch a short video explaining the origin of embryonic stem cells and how they are isolated in the laboratory.</li> </ul>	<ul style="list-style-type: none"> <li>• A visual presentation explaining the basics of stem cells with examples.</li> <li>• A classroom discussion designed to stimulate thinking about the role of stem cells.</li> <li>• Watch a short educational video explaining what stem cells are and how they were first discovered.</li> </ul>	<p>Multipotent Stem Cells</p> <p>Genetic Modification and the Labeling of Cell Lineages</p>	<ul style="list-style-type: none"> <li>• The student explains the basic criteria for identifying stem cells (self-renewal and ability to differentiate).</li> <li>• The student distinguishes between methods of characterizing stem cells in the laboratory, such as molecular markers.</li> <li>• The student analyzes the characteristics of stem cells compared to specialized cells.</li> </ul>	1	Fifth

<ul style="list-style-type: none"> <li>• Multiple-choice questions about the basic concept of stem cells.</li> <li>• A short activity in which the student is asked to write a definition of stem cells.</li> <li>• A quick oral assessment to ensure the student understands the key points in the introduction.</li> <li>• A slide presentation that includes illustrations of differentiation ability levels (Totipotent vs Pluripotent).</li> <li>• A group activity in which students arrange the stages of embryonic development and identify which stage contains each type of ability.</li> <li>• Watch a short video explaining the origin of embryonic stem cells and how they are isolated in the laboratory.</li> </ul>	<ul style="list-style-type: none"> <li>• A visual presentation explaining the basics of stem cells with examples.</li> <li>• A classroom discussion designed to stimulate thinking about the role of stem cells.</li> <li>• Watch a short educational video explaining what stem cells are and how they were first discovered.</li> </ul>	<p>Cell Differentiation and Growth Stem Cells in the Body</p>	<ul style="list-style-type: none"> <li>• The student explains the role of telomeres in cell division and aging.</li> <li>• The student explains the function of the telomerase enzyme and how it affects cell lifespan.</li> <li>• The student analyzes the relationship between telomerase deficiency and aging diseases.</li> </ul>	<p>1</p>	<p>Sixth</p>
<ul style="list-style-type: none"> <li>• Multiple-choice questions about the basic concept of stem cells.</li> <li>• A short activity in which the student is asked to write a</li> </ul>	<ul style="list-style-type: none"> <li>• A visual presentation explaining the basics of stem</li> </ul>	<p>Regenerative Medicine: Clinical Applications of Stem Cells</p>	<ul style="list-style-type: none"> <li>• The student explains the concept of regenerative medicine and the role of stem cells in it.</li> <li>• It identifies the current clinical</li> </ul>	<p>1</p>	<p>Seventh</p>

<p>definition of stem cells.</p> <ul style="list-style-type: none"> <li>• A quick oral assessment to ensure the student understands the key points in the introduction.</li> <li>• A slide presentation that includes illustrations of differentiation ability levels (Totipotent vs Pluripotent).</li> <li>• A group activity in which students arrange the stages of embryonic development and identify which stage contains each type of ability.</li> <li>• Watch a short video explaining the origin of embryonic stem cells and how they are isolated in the laboratory.</li> </ul>	<p>cells with examples.</p> <ul style="list-style-type: none"> <li>• A classroom discussion designed to stimulate thinking about the role of stem cells .</li> <li>• Watch a short educational video explaining what stem cells are and how they were first discovered .</li> </ul>	<p>-Therapeutic Cell Transplantation</p> <p>-Number of Cells Needed for Cell Transplantation</p> <p>-Why Some Diseases will be Treatable with Stem Cells in the Future and Others Not</p> <p>-The Best Stem Cells for Transplantation</p> <p>-Risks Associated with a Stem Cell Transplantation</p> <p>- Stem Cells Rejected After Transplantation</p>	<p>applications of stem cells.</p> <ul style="list-style-type: none"> <li>• The student analyzes the advantages and limitations of using stem cells in therapy</li> </ul>		
<ul style="list-style-type: none"> <li>• Multiple-choice questions about the basic concept of stem cells.</li> <li>• A short activity in which the student is asked to write a definition of stem cells.</li> <li>• A quick oral assessment to ensure the student understands the key</li> </ul>	<ul style="list-style-type: none"> <li>• A visual presentation explaining the basics of stem cells with examples.</li> <li>• A classroom discussion designed to stimulate</li> </ul>	<p>General Embryology</p>	<ul style="list-style-type: none"> <li>• The student defines the basic stages of embryonic development from fertilization to the formation of the three embryonic layers.</li> <li>• The student explains vital processes such as division, implantation, and early differentiation.</li> <li>• The student explains the relationship between early embryonic development and the</li> </ul>	<p>1</p>	<p>Eighth</p>

<p>points in the introduction.</p> <ul style="list-style-type: none"> <li>• A slide presentation that includes illustrations of differentiation ability levels (Totipotent vs Pluripotent).</li> <li>• A group activity in which students arrange the stages of embryonic development and identify which stage contains each type of ability.</li> <li>• Watch a short video explaining the origin of embryonic stem cells and how they are isolated in the laboratory.</li> </ul>	<p>thinking about the role of stem cells .</p> <ul style="list-style-type: none"> <li>• Watch a short educational video explaining what stem cells are and how they were first discovered .</li> </ul>		<p>emergence of different body systems</p>		
<ul style="list-style-type: none"> <li>• Multiple-choice questions about the basic concept of stem cells.</li> <li>• A short activity in which the student is asked to write a definition of stem cells.</li> <li>• A quick oral assessment to ensure the student understands the key points in the introduction.</li> <li>• A slide presentation that includes illustrations of differentiation ability levels</li> </ul>	<ul style="list-style-type: none"> <li>• A visual presentation explaining the basics of stem cells with examples.</li> <li>• A classroom discussion designed to stimulate thinking about the role of stem cells .</li> </ul>	<p><b>Gametogenesis: conversion of germ cells into male and female gametes</b></p>	<ul style="list-style-type: none"> <li>• The student explains the concept of gametogenesis and its role in sexual reproduction.</li> <li>• The student distinguishes between the stages of sperm formation (Spermatogenesis) and egg formation (Oogenesis).</li> <li>• It describes the cellular and genetic changes that occur during meiosis in both processes</li> </ul>	<p>1</p>	<p>Ninth</p>

<p>(Totipotent vs Pluripotent).</p> <ul style="list-style-type: none"> <li>• A group activity in which students arrange the stages of embryonic development and identify which stage contains each type of ability.</li> <li>• Watch a short video explaining the origin of embryonic stem cells and how they are isolated in the laboratory.</li> </ul>	<ul style="list-style-type: none"> <li>• Watch a short educational video explaining what stem cells are and how they were first discovered.</li> </ul>				
<ul style="list-style-type: none"> <li>• Multiple-choice questions about the basic concept of stem cells.</li> <li>• A short activity in which the student is asked to write a definition of stem cells.</li> <li>• A quick oral assessment to ensure the student understands the key points in the introduction.</li> <li>• A slide presentation that includes illustrations of differentiation ability levels (Totipotent vs Pluripotent).</li> <li>• A group activity in which students arrange the stages of embryonic development and</li> </ul>	<ul style="list-style-type: none"> <li>• A visual presentation explaining the basics of stem cells with examples.</li> <li>• A classroom discussion designed to stimulate thinking about the role of stem cells.</li> <li>• Watch a short educational video explaining what stem cells are and how they were</li> </ul>	<p>First week of development: ovulation to implantation</p>	<ul style="list-style-type: none"> <li>• The student describes the stages of the first week after ovulation, including fertilization, zygote formation, cleavage, and morula formation.</li> <li>• The student explains the formation of the blastocyst and its developmental stages in preparation for implantation.</li> <li>• The student explains the process of implantation in the uterine lining and the role of embryonic cells in this stage.</li> </ul>	<p>1</p>	<p>tenth</p>

<p>identify which stage contains each type of ability.</p> <ul style="list-style-type: none"> <li>• Watch a short video explaining the origin of embryonic stem cells and how they are isolated in the laboratory.</li> </ul>	<p>first discovered</p>				
		<p>Second week of development: Bilaminar germ disc</p>	<ul style="list-style-type: none"> <li>• The student describes the formation of the two-layered embryonic disc (Epiblast and Hypoblast) during the second week.</li> <li>• The student explains the formation of the embryonic membranes (Amniotic cavity, Yolk sac) and the outer lining of the embryo.</li> <li>• The student explains the importance of the development of the two-layered embryonic disc in preparing for the later three layers (Gastrulation).</li> </ul>	<p>1</p>	<p>eleventh</p>
<ul style="list-style-type: none"> <li>• Multiple-choice questions about the basic concept of stem cells.</li> <li>• A short activity in which the student is asked to write a definition of stem cells.</li> <li>• A quick oral assessment to ensure the student understands the key</li> </ul>	<ul style="list-style-type: none"> <li>• A visual presentation explaining the basics of stem cells with examples.</li> <li>• A classroom discussion designed to stimulate</li> </ul>	<p>Third week of development: Trilaminar germ disc</p>	<ul style="list-style-type: none"> <li>• The student explains the process of <b>gastrulation</b>. The embryonic disc consists of <b>three layers (Ectoderm, Mesoderm, Endoderm)</b>.</li> <li>• The student explains the formation of the <b>starting line (primitive streak)</b>. And its role in guiding the formation of social classes.</li> </ul>	<p>1</p>	<p>twelfth</p>

<p>points in the introduction.</p> <ul style="list-style-type: none"> <li>• A slide presentation that includes illustrations of differentiation ability levels (Totipotent vs Pluripotent).</li> <li>• A group activity in which students arrange the stages of embryonic development and identify which stage contains each type of ability.</li> <li>• Watch a short video explaining the origin of embryonic stem cells and how they are isolated in the laboratory.</li> </ul>	<p>thinking about the role of stem cells .</p> <ul style="list-style-type: none"> <li>• Watch a short educational video explaining what stem cells are and how they were first discovered .</li> </ul>		<ul style="list-style-type: none"> <li>• The student explains the importance of Trilaminar Germ Disc in the formation of future embryonic organs and tissues.</li> </ul>		
<ul style="list-style-type: none"> <li>• Multiple-choice questions about the basic concept of stem cells.</li> <li>• A short activity in which the student is asked to write a definition of stem cells.</li> <li>• A quick oral assessment to ensure the student understands the key points in the introduction.</li> <li>• A slide presentation that includes illustrations of differentiation ability levels</li> </ul>	<ul style="list-style-type: none"> <li>• A visual presentation explaining the basics of stem cells with examples.</li> <li>• A classroom discussion designed to stimulate thinking about the role of stem cells .</li> </ul>	<p>Third to eight week: The Embryonic period</p>	<ul style="list-style-type: none"> <li>• The student describes the main stages of the embryonic period (organogenesis) from the third to the eighth week.</li> <li>• The student explains the development of vital organs such as the heart, nervous system, digestive system, and limbs.</li> <li>• The student explains the importance of this period in determining the external appearance of the fetus and its susceptibility to birth defects .</li> </ul>	<p>1</p>	<p>thirteenth</p>

<p>(Totipotent vs Pluripotent).</p> <ul style="list-style-type: none"> <li>• A group activity in which students arrange the stages of embryonic development and identify which stage contains each type of ability.</li> <li>• Watch a short video explaining the origin of embryonic stem cells and how they are isolated in the laboratory.</li> </ul>	<ul style="list-style-type: none"> <li>• Watch a short educational video explaining what stem cells are and how they were first discovered.</li> </ul>				
<ul style="list-style-type: none"> <li>• Multiple-choice questions about the basic concept of stem cells.</li> <li>• A short activity in which the student is asked to write a definition of stem cells.</li> <li>• A quick oral assessment to ensure the student understands the key points in the introduction.</li> <li>• A slide presentation that includes illustrations of differentiation ability levels (Totipotent vs Pluripotent).</li> <li>• A group activity in which students arrange the stages of embryonic development and</li> </ul>	<ul style="list-style-type: none"> <li>• A visual presentation explaining the basics of stem cells with examples.</li> <li>• A classroom discussion designed to stimulate thinking about the role of stem cells.</li> <li>• Watch a short educational video explaining what stem cells are and how they were</li> </ul>	<p>Third month to birth: The fetus and placenta</p>	<ul style="list-style-type: none"> <li>• The student describes the stages of fetal development from the third month until birth, focusing on the growth of organs and vital systems.</li> <li>• The student explains the formation of the placenta and its functions in nutrition, gas exchange, and protecting the fetus.</li> <li>• The student explains the relationship between fetal growth and placental functions and their impact on the health of the mother and fetus.</li> </ul>	<p>1</p>	<p>fourteenth</p>

<p>identify which stage contains each type of ability.</p> <ul style="list-style-type: none"> <li>• Watch a short video explaining the origin of embryonic stem cells and how they are isolated in the laboratory.</li> </ul>	<p>first discovered .</p>				
<ul style="list-style-type: none"> <li>• Multiple-choice questions about the basic concept of stem cells.</li> <li>• A short activity in which the student is asked to write a definition of stem cells.</li> <li>• A quick oral assessment to ensure the student understands the key points in the introduction.</li> <li>• A slide presentation that includes illustrations of differentiation ability levels (Totipotent vs Pluripotent).</li> <li>• A group activity in which students arrange the stages of embryonic development and identify which stage contains each type of ability.</li> <li>• Watch a short video explaining the origin of embryonic stem cells and how</li> </ul>	<ul style="list-style-type: none"> <li>• A visual presentation explaining the basics of stem cells with examples.</li> <li>• A classroom discussion designed to stimulate thinking about the role of stem cells .</li> <li>• Watch a short educational video explaining what stem cells are and how they were first discovered .</li> </ul>	<p>Birth defects and prenatal diagnosis</p>	<ul style="list-style-type: none"> <li>• The student identifies the common types of birth defects and their causes (genetic, environmental, (multifactorial.</li> <li>• The student explains the different methods of prenatal diagnosis (Ultrasound, Amniocentesis, Chorionic villus sampling).</li> <li>• The student explains the importance of early detection in the prevention and management of birth defects.</li> </ul>	<p>1</p>	<p>fifteenth</p>

they are isolated in the laboratory.					
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<b>Course Evaluation .12</b>
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<b>Learning and teaching resources .13</b>
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<p><b>Langman's Medical Embryology (Longmans Medical Embryology) Fifteenth, North American Edition/January 13,2023</b></p> <p>by <a href="#">Dr. TW Sadler PhD</a> (Author)</p> <p><b>Prepared by: Dr. Ahmed Salem Mohammed/ Stem Cell Science</b></p> <p><b>Prepared by: Dr. Hind Jaber Hassoun/ Embryology</b></p>		
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