Academic Program Description Template

University Name: Tikrit University

College/Institute: College of Education for Women

Department: Department of Life Sciences

Academic or Professional Program Name: Bachelor of Science in Life Sciences

Certificate Name: Bachelor of Science in Life Sciences

Academic System: Annual

Date of Description Preparation: 2/11/2025

Date of File Completion: 2/11/2025

Department Head: Assistant Professor Dr. Ali Muayad Sultan

Date: **Signature:**

Deputy Scientific [illegible]: Professor Dr. Ashraf Jamal Mahmoud

Date: **Signature:**

File Reviewed by:

Quality Assurance and University Performance Division

Name of Director of Quality Assurance and University Performance Division:

Date:

Signature:

Dean's Approval

Prof. Dr. Najla Abdul Hussein Alawi

2, 11, 2025

1.ProgramVision

1- Leadership and innovation in the field of conducting scientific experiments.
2- Elevating the level of the laboratory according to the needs of the students.
3- Equipping students with the theoretical and applied foundations and information in the field of chemistry and making them competent and capable of offering their expertise to serve the community.

2.ProgramMission

1- Providing academic education and practical training in the field of scientific laboratories and equipping students with practical skills in line with international standards.
2- Elevating the level of the department according to the needs of the students.
3-Preparing a conscious generation of students who possess scientific and practical experience in the field of chemistry.
4- Training and preparing students on how to avoid risks to ensure chemical safety and security within the laboratory.

3.ProgramObjectives

1- Qualifying students technically and academically in the practical field and applications of chemistry laboratories.
2- Preparing students and establishing the foundations of chemistry for them.
3- Opening future prospects and attracting students towards the scientific and practical aspects in a better way.
4- Guiding students towards engaging with environmental problems around them and finding solutions to serve the community.
5- Playing an active and influential role in the fields of analysis and quality control.
6- Preparing a generation of qualified and competent teachers to join the education sector.

4.ProgramAccreditation

Awaiting the Academic Accreditation Committee

5.Otherexternalinfluences

The School Application - Laboratory Practical Training
Theoretical and Practical Graduation Research Projects

6.ProgramStructure

Program Structure	Number of Courses	A study unit	Percentage	Notes
Enterprise Requirements	**nothing**			
College Requirements	**nothing**			
Department Requirements	**40**	**180**	**10%first stage rate 20% second stagerate 30% third stage rate 40% stage four rate**	
Summer Training	**nothing**			
Others	**Watching and applying female students in schools**			

* Can include notes on whether the course is required or elective.

7.ProgramDescription

The year / level	Course code or course title	Course name or subject	Approved hours		Units
The first/preliminary stage	**nothing**	**General Biology**	2	2	6
The first/preliminary stage	**nothing**	**Plant Anatomy**	2	2	6
The first/preliminary stage	**nothing**	**Cell Biology**	2	2	6
The first/preliminary stage	**nothing**	**General Chemistry**	**1**	**2**	4
The first/preliminary stage	**nothing**	**Geology**	**1**	**0**	2
The first/preliminary stage	**nothing**	**Fundamentals of Education**	**1**	**0**	**2**
The first/preliminary stage	**nothing**	**Developmental and Educational Psychology**	**2**	**0**	4
The first/preliminary stage	**nothing**	**Biosafety and Security**	**1**	**0**	2
The first/preliminary stage	**nothing**	**Computer 1**	**1**	**0**	2
The first/preliminary stage	**nothing**	**Arabic language**	**1**	**0**	2
The first/preliminary stage	**nothing**	**English language**	**1**	**0**	2
The first/preliminary stage	**nothing**	**Democracy and Human Rights**	**1**	**0**	2
The second/initialstage	**nothing**	**Invertebrates**	**2**	**2**	6
The second/initialstage	**nothing**	**Plant Taxonomy**	**2**	**2**	6

The second/initialstage	**nothing**	**Histology**	**2**	**2**	6
The second/initialstage	**nothing**	**Embryology**	**2**	**2**	6
The second/initialstage	**nothing**	**Biochemistry**	**1**	2	4
The second/initialstage	**nothing**	**Leadership and Educational Administration**	**2**	0	4
The second/initialstage	**nothing**	**Curriculums and School Books**	**1**	2	4
The second/initialstage	**nothing**	**Teaching Thinking**	**1**	0	interpolation
The second/initialstage	**nothing**	**Computer 2**	**1**	0	2
The second /initial stage	**nothing**	**Arabic language**	**1**	0	2
The second /initial stage	**nothing**	**English language**	**1**	0	2
The second /initial stage	**nothing**	**Baath Regime Crimes in Iraq**	**1**	0	2
The third/initial stage	**nothing**	**Ecology and Pollution**	**2**	**2**	6
The third/initial stage	**nothing**	**Entomology**	**2**	**2**	6
The third/initial stage	**nothing**	**Comparative anatomy Chordate**	**2**	**2**	6
The third/initial stage	**nothing**	**Algae and Archegoniates**	**2**	**2**	6
The third/initial stage	**nothing**	**Genetics**	**2**	**2**	6
The third/initial stage	**nothing**	**Mycology**	**2**	**2**	6
The third/initial stage	**nothing**	**Counseling and Psychological Health**	**1**	2	4
The third /initial stage	**nothing**	**Teaching Methods**	**1**	2	4
The third /initial stage	**nothing**	**Educational Teachnology and its Applications**	**1**	2	4
The fourth/initial stage	**nothing**	**Parasitology**	**2**	2	6
The fourth/initial stage	**nothing**	Animal Physiology	**2**	2	6
The fourth/initial stage	**nothing**	**Plant Physiology**	**2**	2	6
The fourth/initial stage	**nothing**	**Microbiology**	**2**	2	6
The fourth/initial stage	**nothing**	**Immunology**	**2**	2	6
The fourth/initial stage	**nothing**	**Elective**	**2**	0	4
The fourth/initial stage	**nothing**	**Research Project**	**2**	0	2
The fourth/initial stage	**nothing**	**Measurement and Evaluation**	**2**	0	4

The fourth/initial stage	**nothing**	**Practical Education**	**1**	2	4
The fourth/initial stage	**nothing**	**Action Research**	**1**	2	4

8.Expectedlearningoutcomesoftheprogram

Knowledge

1Learning Outcomes Cognitive Objectives **1-** Empowering students to acquire knowledge and overall intellectual understanding of chemistry. **2-** Empowering students to acquire knowledge and understanding of the laws of chemistry. **3-** Empowering students to acquire knowledge and understanding of chemistry in English. **4-** Empowering students to acquire knowledge and understanding of chemical analysis standards.	**1**Learning Outcomes Statement **1-** Empowering students to acquire knowledge of the basic principles of chemistry. **2-** Providing students with knowledge through homework assignments of study vocabulary.

Skills

2Learning Outcomes General Skills: **1-** Communication and Information Technology skills and developing strategies for teamwork. **2-** Proficiency in modern communication techniques, documentation, and communication with institutions and scientific centers. **3-** Possessing language skills (fluency in speaking, writing, and understanding Arabic and English) in the art of listening, persuasion, and dialogue. **4-** Problem-solving skills in education using educational and psychological programs and methods. **5-** Possessing leadership qualities, memory power, intuitive speed, and the ability to predict and infer	**2-**Statement of Learning Outcomes Empowering students to solve problems that are relevant to their learning style in the lesson.
3-Learning Outcomes Skills Objectives: **1 -** Scientific and practical skills.	**3-** Statement of Learning Outcomes Empowering students to solve problems related to teaching steps and employ the

2 - Remembering and analytical skills. **3 -** Utilization and development skills.	appropriate method.
The values	
Learning outcomes 4/ Daily and monthly exams	Learning outcomes statement 4/ Final exams
Learning outcomes 5/ Competitive grades for daily participation in the lesson	Learning outcomes statement 5/ Attendance and regularity grades in lectures

9. TeachingandLearningStrategies

Providing students with the basics and topics related to knowledge and systems explained in:

1- Clarifying and explaining the study materials by the academic staff through the whiteboard and Data Show.

2- Providing students with knowledge through homework for study vocabulary.

3- Encouraging students to visit the library to obtain academic knowledge related to study vocabulary.

4- Improving students' skills by visiting electronic sites to obtain additional knowledge for study materials.

10. Evaluationmethods

1- Daily tests with multiple-choice questions for academic subjects.

2- Grades are assigned for challenging competitive questions for students.

3- Grades are assigned for assigned homework.

4- Quality and quantity practical tests in laboratories.

5- Assigning students to conduct scientific seminars and discuss them.

11. Faculty

Faculty Members

AcademicRank	Specialization		Special Requirements/Skills (if applicable)	Numberof the teaching staff
	General	Special		
Prof	Zoology	Parasitology	.	2
Prof	Ecology	Enverонment and Pollution		1
assistant professor	Ecology	Microbiology enverонment		1
assistant professor	Microbiology	Microbiology		1
assistant professor	Zoology	Tissues and Embryology		1
assistant professor	Zoology	Parasitology		1
assistant professor	Zoology	Physiology		2
assistant professor	Zoology	Comparative anatomy		1
assistant professor	Zoology	Entomology		1
assistant professor	Botany	Mycology		1
assistant professor	Botany	Botany		1
assistant professor	Ecology	Enverонment Botany		1

Doctor teacher	Zoology	Physiology		2
Doctor teacher	Zoology	Pasitology		2
Doctor teacher	Microbiology	Nutrition		2
Doctor teacher	Microbiology	Microbiology		1
Doctor teacher	Zoology	Entomology		1
Teacher	Zoology	Parasitology		1
Teacher	Ecology	Enveronment and Pollution		1
Assistant teacher	Ecology	Enveronment and Pollution		1
Assistant teacher	Botany	Botany		1
Assistant teacher	Zoology	Tissues and Embryology		2
Assistant teacher	Zoology	Physiology		4
Assistant teacher	Zoology	Parasitology		3
Assistant teacher	Plant Protection	Entomology		1
Assistant teacher	Microbiology	Microbiology		2
Assistant teacher	Ecology	Microbiology enveronment		1
Assistant teacher	Psychology	Teaching Methods		1

12.AcceptanceCriterion

1- Acceptance based on the overall and central grade system.
2- Acceptance in departments based on student's preference and grade.
3- Condition that the student must be a graduate of preparatory study and scientific branch only.
4- The accepted student must have sound personal and mental health and be free from physical disabilities.
5- The capacity of the college's departments to accommodate students.

13. Themostimportantsourcesofinformationabouttheprogram

1- The curriculum approved by the Ministry of Higher Education and Scientific Research and its guiding references.
2- Courses and recommendations from scientific committees at the university.
3- Courses in teaching methods.
4- Training courses organized by the college on e-learning platforms.**Program Skills Outline**
5- Internet research for similar experiments.
6- Personal experiences.

14. ProgramDevelopmentPlan

1- Development of the curriculum through deletion, addition, and replacement.
2- Use of modern teaching methods according to the nature of the subject and the level of learners from time to time.
3- Use of modern evaluation methods such as alternative and electronic assessment.

Program Skills Outline

RequiredprogramLearningoutcomes

Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
			Mandatory	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
The first		Organic chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Analytical chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		mathematics	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Security and safety	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Life sciences	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Calculators	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Human rights	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Arabic	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		English language	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Inorganic chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Developmental and educational psychology	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
Second		Organic chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Inorganic chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Developmental psychology	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Physical chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Analytical chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Calculators	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Educational administration	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		mathematics	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		English language	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
Third		Organic chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Coordination chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Physical chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Biochemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Research methodology	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Teaching methods	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		optional	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Industrial chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Educational guidance	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		English language	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*

Fourth		Biochemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*		*
		Practical education (watch and apply)	Mandatory	*	*	*	*	*	*	*	*	*	*	*		*
		Measurement and evaluation	Mandatory	*	*	*	*	*	*	*	*	*	*	*		*
		Diagnosis	Mandatory	*	*	*	*	*	*	*	*	*	*	*		*
		optional	Mandatory	*	*	*	*	*	*	*	*	*	*	*		*
		Automated analysis	Mandatory	*	*	*	*	*	*	*	*	*	*	*		*
		Quantum chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*		*
		English language	Mandatory	*	*	*	*	*	*	*	*	*	*	*		*
		Industrial chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*		*

***Pleasetickthe boxescorrespondingtotheindividual programlearningoutcomesunder evaluation.**

Course Description Form

1. Course Name:
Biology
2. Course Code:
Biology / first stage
3. Semester / Year:
٢٠٢٥
4. Description Preparation Date:
/١١/٢٠٢٥
5. Available Attendance Forms:
Class Lecture + Electronic Lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
70 hours.
7. Course administrator's name (mention all, if more than one name)
Name: Dunia Abed Hussain Email: Dunia _abed@tu.edu.iq
8. Course Objectives

Course Objectives	• Informing students of the most important biologists in the past. • To introduce female students to reproductive methods in plants and animals. • Female students understand the difference between the plant and animal cell.
9. Teaching and Learning Strategies	
Strategy	To provide students with knowledge of scientific goals and how to achieve them. To give students all that's modern on the side of biology that benefits them and to know what's in modern biology.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2		The five worlds include fungus primitives/ plant	Standard method, Text Method	Class performance and exams
2	2		Definition of qualities of life	Standard method, Text Method	Class performance and exams
3	2		Taxonomy	Standard method, Text Method	Class performance and exams
4	2		The chemistry of respiration and energy conversion	Standard method, Text Method	Class performance and exams
5			Physiology and chemistry of photosynthesis	Standard method, Text Method	Class performance and exams
6	2		Reproduction and growth in animals	Standard method, Text Method	Class performance and exams
7	2		Harmony in plants	Standard method, Text Method	Class performance and exams
8	2		The food chain	Standard method, Text Method	Class performance and exams
9	2		Branches of zoology	Standard method, Text Method	Class performance and exams
10	2		Animal cell	Standard method, Text Method	Class performance and exams
11	2		Physical properties of protoplasm	Standard method, Text Method	Class performance and exams
12	2		The germ cell.	Standard method, Text Method	Class performance and exams
13	2		Painting tissue.	Standard method, Text Method	Class performance and exams
14	2		Muscle tissue.	Standard method, Text Method	Class performance and exams
15	2		Final exams		

11-Course Evaluation	
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc	
12-Learning and teaching resources	
(Required textbooks (methodology, if any	Professor Dr. Nizar Mustafa Al-Mallah
Main references (sources)	Professor Dr. Hussein Ali Al-Saadi
Recommended supporting books and references (scientific journals, reports)	Biology author Peter Haven et al
Electronic references, Internet sites	Any website related to biology

1. Program Vision

The vision of the Life Sciences Department is centered on preparing scientifically and educationally qualified female teachers in order to create good generations that will bear responsibility and build the personality of the graduate in an integrated manner to provide her with the knowledge and skills to confront and solve difficulties in the field of scientific research, which contributes to the progress of society and contributes to the process of preparing and developing human resources and preparing teaching staff to supply middle schools. And secondary school to serve the scientific and educational process and achieve the goals of higher education and the goals of the College of Education in light of the central philosophy of the state, serve civil society, hold conferences, seminars and workshops, whether in person or electronically remotely, and carry out a group of discussion circles, workshops, courses and seminars.

2. Program Mission

The Department of Life Sciences is one of the departments of the College of Education for Girls, and it is one of the departments that was established

In 1987, the initial study period was four years. This department granted a bachelor's degree

To enable her to work in the teaching profession in secondary education for biology and science

3. Program Objectives

The goals of the Life Sciences Department are divided into three types: cognitive and scientific goals at the theoretical and applied levels, valuable goals at the scientific level, and skills goals at all levels. Building the capabilities and abilities of graduates and members of the Life Sciences Department. In addition to the goals mentioned, there are other goals: 1- Preparing and developing female students and expanding their awareness. Sensory, intellectual and scientific for all subjects, whether scientific or literary, so that it qualifies them for teaching and scientific research in the institutions of the Ministry of Education and other ministries that can benefit from the scientific experiences of students graduating from the department.-٢ Enabling female students to rely in their practical lives on applying scientific methods in addressing problems and situations by relying on practical studies in analysis and study, especially in research fields and studies that serve and benefit society. 3- Preparing and developing the scientific sense of some distinguished female students in order to keep up with their scientific

studies, including their submission to studies. Higher education by urging and encouraging them to be a basic base in the academic institutions with these experiences and the departments' need as teachers who serve in their various fields and according to their scientific specializations 4- Building and scientific, professional and cultural preparation for the students and graduates of the Life Sciences Department and enabling them to master and know the facts and theoretical concepts of biology. 5- Qualifying male and female graduates of the Department of Life Sciences for the purpose of understanding the basic principles that qualify them to teach in educational institutions and contributing to scientific research in all cognitive specializations. 6- Developing beneficial behaviors and values among female students in a way that is consistent and compatible with Arab and Islamic values and the principles of other heavenly religions and to lead them to the highest level. Degrees of moral, intellectual and scientific maturity

4. Program Accreditation

nothing

5. Other external influences

Ministry of Higher Education and Scientific Research/ Tikrit University

6 Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews•
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
2025/2026 Third stage			theoretical	practical
			2 hours	2hours

8. Expected learning outcomes of the program

Knowledge

Learning Outcomes 1	Learning Outcomes Statement 1

Skills

Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Learning Outcomes 3	Learning Outcomes Statement 3

Ethics

Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5
Learning Outcomes S	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

1-The standard method / giving lectures / the text method / the descriptive, analytical and inductive method. 2- Method of solving problems/constructive or formative evaluation (daily exams, class discussion, homework assignments, and their follow-up, classroom evaluation). 3- Diagnostic evaluation (semester and final exams to issue judgments of success and failure).

10. Evaluation methods

1- Individual and group oral and written theoretical and practical tests. 2- Direct observation of the student's performance in the areas of dialogue, intellectual and scientific communication, and teamwork within the classroom and the college and university environment. 2- Assigning female students to prepare distinctive scientific research to test their ability to think, conclude, and solve problems.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	**Lecturer**
Teacher Thabit muthhir Assistant Teacher Zahra Khalil Ismael	Animal Agricultural Sience	Insect Plant Protection(Insect)			Yes yes	

Professional Development

Mentoring new faculty members

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

Professional development of faculty members

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

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Course Description Form

1. Course Name:
Insect Sience
2. Course Code:
Insect Sience /Third stage
3. Semester / Year:
2024-2025
4. Description Preparation Date:
18/9/2024
5. Available Attendance Forms:
Class attendance inside the classroom + attendance inside the laboratory + electronic classes on the (Google Classroom) platform, which will be a supporting class for the in-person class, according to the controls and instructions of the Ministry of Higher Education and Scientific Research
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours
7. Course administrator's name (mention all, if more than one name)
Dr.Thabet Mudheher Khalaf Email:Dr.thabit@tu.edu.iq Assistant Teacher Zahra Khalil Asmail Email: zkhalil@tu.edu.iq
8. Course Objectives

Course Objectives	Introducing the student to all parts and types of insects • 2. The student knows the difference between harmful and beneficial insects • 3. Introducing the student to the components of the insect's internal systems • 4. Introducing the student to entomology and its relationship to other sciences

9. Teaching and Learning Strategies

Strategy	Providing psychological motivation to achieve scientific goals Providing modern scientific lectures that keep pace with developments and from various sources

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	٢	Understanding the ideas of the topic and being able to apply it with examples	General introduction, definition of entomology, the importance of insects, and the relationship of insects with humans and animals	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٢	٢	Understanding the ideas of the topic and being able to apply it with examples	Sciences related to entomology	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٣	٢	Understanding the ideas of the topic and being able to apply it with examples	The presence of insects, the reasons for their success and spread, and important sources	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٤	٢	Understanding the ideas of the topic and being able to apply it with examples	Location of insects in the animal kingdom, comparing insects with other types	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٥	٢		General characteristics of the external appearance of the body wall, its areas and benefits	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests

٦	٢	Understanding the ideas of the topic and being able to apply it with examples	Areas of the body: the head, its types, mouth parts, their definition, and study of mouth parts mutations	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٧	٢	Understanding the ideas of the topic and being able to apply it with examples	Eyes, their types, compound and simple, and the structure, number, and arrangement of eyes	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٨	٢	Understanding the ideas of the topic and being able to apply it with examples	Tentacles: their definition, composition, types and benefits	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٩	٢	Understanding the ideas of the topic and being able to apply it with examples	The chest has its rings, the composition of the wingless and winged chest	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
١٠	٢	Understanding the ideas of the topic and being able to apply it with examples	Legs, their types, components and benefits. Wings, their types. Flight mechanics and wing clamping devices.	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
١١	٢	Understanding the ideas of the topic and being able to apply it with examples	The abdomen, the number of rings, their arrangement, and their areas. The external reproductive organs of males and females	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
١٢	٢	Understanding the ideas of the topic and being able to apply it with examples	Internal anatomy of the digestive system and its appendages	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests

١٣	٢	Understanding the ideas of the topic and being able to apply it with examples	The nervous system and its types	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
١٤	٢	Understanding the ideas of the topic and being able to apply it with examples	The respiratory system and its types	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
١٥	٢	Understanding the ideas of the topic and being able to apply it with examples	The blood circulatory system, its components and blood functions	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
١٦	٢	Understanding the ideas of the topic and being able to apply it with examples	Sense organs, mechanical receptors, hearing organs, chemical receptors, organs of sight, organs for sensing temperature and humidity.	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
١٧	٢	Understanding the ideas of the topic and being able to apply it with examples	Growth and transformation stages: immature stages The egg, the juvenile, the nymph, the larva and its types, the pupa, and the definition of metamorphosis and its types Methods of reproduction in insects	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests

١٨	٢	Understanding the ideas of the topic and being able to apply it with examples	The method of understanding between insects, between individuals of the same species, between individuals of different species, pheromones, sounds, and movements	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
١٩	٢	Understanding the ideas of the topic and being able to apply it with examples	Insect classification, taxonomy, its definition, types, and historical stages	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٢٠	٢	Understanding the ideas of the topic and being able to apply it with examples	Binary scientific nomenclature and its laws	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٢١	٢	Understanding the ideas of the topic and being able to apply it with examples	The concept of species, subspecies, and primary and secondary taxonomic ranks. Basis of classification and basic characteristics. Different ranks.	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٢٢	٢	Understanding the ideas of the topic and being able to apply it with examples	The most important insect orders from an economic standpoint	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٢٣	٢	Understanding the ideas of the topic and being able to apply it with examples	Honey bees, their benefits, diseases, definition of the colony, its characteristics, division of labor among the colony members	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests

٢٤	٢	Understanding the ideas of the topic and being able to apply it with examples	The concept of insect pest control and its types	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٢٥	٢	Understanding the ideas of the topic and being able to apply it with examples	Hormones, definition of the hormone, youth hormone, how it works, moulting hormone, how it works	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٢٦	٢	Understanding the ideas of the topic and being able to apply it with examples	The role of hormones in insect control recently	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
٢٧					

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written , reports.....etc	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Tissue
2. Course Code:
Bio108
3. Semester / Year:
2026
4. Description Preparation Date:
2/11/2025
5. Available Attendance Forms:
Class lectures + electronic lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hourse
7. Course administrator's name (mention all, if more than one name)
Name: Hala Hameed Email: halahameed@tu.edu..iq
8. Course Objectives

Course Objectives	Enabling female students to become familiar with the subject of histology asitis one of the basic branches of life sciences. Helping students understand the physiology and function of different tissues and cells found in the body Enhancing femal students awareness of the horizons of life sciences and providing them with scientific and practical skills in their lives.

9. Teaching and Learning Strategies	
Strategy	Providing Psychological motivation to achieve scientific goals.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1.Program vision
1- Creativity in the field of using laboratory equipment. 2- Improving the level of laboratories. 3- Helping female students acquire scientific skills and abilities and making them able to present their expertise to society.

2.Program message
1- Improving the level of the department according to the needs of female students. 2- Preparing a conscious generation of female students who possess sufficient scientific ability. 3- Preparing female students and training them on how to avoid risks to ensure their safety inside laboratories.

3.Goals of program
1- Preparing a generation of qualified and competent professors to join Education line. 2-guidanceStudents interact with the problems of the surrounding environment and develop solutions to serve the community. 3-OpenProspectsScientific and attracting female students towards the scientific and practical aspects in a waybetter.

4.Program accreditation
Is the program accredited? From which authority? No.

5. The other External influences
Field visits - conducting training and educational courses - school application - practical laboratory training

6.Program structure				
Notes/Comments	**Percentage**	**Study unit**	**Number of courses**	**Program structure**
			Nothing	Enterprise requirements
			Nothing	College requirements
				Department requirements
			Nothing	summer training
			Watching and applying female students in schools	Other

***Notes may include whether the course is core or elective**

		7.Program description		
Credit hours		**Name of the course**	**Course code**	**Year/level**
theoretical	**practical**	**Cell biology**	**Bio101a**	**2026/2025**
Two hours	**Two hours**			

8.Expected learning outcomes of the program	
Knowledge	
Statement of learning outcomes 1 1-Providing students with knowledge through homework	Learning outcomes 1 1-Enabling female students to obtain knowledge and a comprehensive and intellectual understanding of cell biology

2-Providing students with sufficient information about cell biology .	2-Enabling students to obtain sufficient experience to distinguish between cell types
Skills	
Statement of learning outcomes 2 Enabling students to solve problems related to the method that suits students in the practical lesson to complete the tasks required in the laboratory, such as preparing and diagnosing slides	Learning outcomes 2 Enabling students to conduct practical experiments in the laboratory and learn about the most important tools used in conducting experiments
Statement of learning outcomes 3 Enabling students to solve problems related to the method that suits students in the practical lesson to complete the tasks required in the laboratory, such as preparing and diagnosing slides	Learning outcomes 3 Enabling students to conduct practical experiments in the laboratory and learn about the most important tools used in conducting experiments
Values	
Statement of learning outcomes 4/final exams	Learning outcomes 4/Daily and monthly exams and reports
Statement of learning outcomes 5/attendance grades	Learning Outcomes 5 / Competition marks for daily contributions in the lesson
9.Teaching and learning strategies	
1-The standard method (scheduled) and (e-learning). 2-Inductive (deductive) method. 3-Method of solving problems	

4-Classroom interaction and exchange of opinions between students and teachers to raise learning difficulties and discuss their solutions.

5-Clarifying and explaining study materials by the academic staff through the use of the whiteboard, smart board, educational laboratory, video clips, pictures, and Data Show.

6-Providing students with knowledge through homework assignments for academic vocabulary.

7-Asking students to visit the library to obtain academic knowledge related to academic vocabulary.

8-Improving female students' skills by visiting websites to obtain additional knowledge of academic and scientific subjects.

10.Evaluation methods

1- Formative assessment (daily exams, attendance and regularity) .

2-Personal evaluation (semester and final exams to issue judgments of success and failure) .

3-Practical tests in laboratories.

4-Assigning female students to prepare scientific research to test their abilities to think, deduce, and solve problems.

5-Field visits to laboratories of various departments at the university

6-Distributing grades according to the tasks assigned to female students, such as daily attendance, the practical aspect, scientific reports, and daily, monthly, and final exams.

11.The teaching staff

Faculty members

Scientific rank	**Specialization**		**Requirements/skills (if any)**	**Preparing the teaching staff**	
	general	private		Own's holding	Lecturer

Professional development
Orienting new faculty members
1-Using modern scientific sources. 2-Using high-speed communication networks to transfer information, such as the Internet. 3-Visits and practical practices in service laboratories. 4-Acquiring modern scientific experiences and skills in the field of modern technical communication.
Professional development for faculty members
1-Continuous improvement and development of faculty members through training programs and workshops inside and outside the department, university and country. 2-Increasing extracurricular activities such as holding conferences, scientific seminars, and personal and sports creativity locally, regionally and internationally. 3-Encouraging faculty members to obtain the highest academic and administrative ranks. 4-Providing modern scientific sources and books for the department's library to keep pace with the advanced progress in various sciences. 5-Providing specialized software in the branches of life sciences and computers necessary for this, along with Internet lines for all teachers.
12.Acceptance criterion
1-Acceptance according to the general and central average system. 2-Admission to departments according to the student's desire and grade point average.

3-The student must be a graduate of preparatory school and the scientific stream exclusively 4-The accepted student's personal and mental safety and freedom from physical disabilities. 5-The absorptive capacity of the college departments.
13.The most important sources of information about the program
1-The curriculum approved by the Ministry of Higher Education and Scientific Research and its guidelines. 2-Decisions and recommendations of the scientific committees at the university. 3-Courses in teaching methods. 4-Training courses held by the college on e-learning platforms. 5-Research on the Internet for similar experiences. 6-Personal experiences. 7-Training courses held by university quality and performance departments on the program in various institutes and colleges.
14.Program development plan
1-Developing the academic content by deleting, adding, and replacing. 2-Using modern teaching methods according to the nature of the subject and the level of the learners from time to time. 3-Using modern orthodontic methods such as alternative and electronic evaluation 4.Holding curriculum development courses. 5-Holding seminars and workshops to keep pace with the development of curricula.

Program skills chart						
Learning outcomes required from the programme						
Year/level	Course Code	Course Name	Essential or optional?	Knowledge	Skills	Value

2025/ 2026	Bio 101a	Cell biology	Basic	11	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

***Please check the boxes corresponding to the individual learning outcomes from the program subject to evaluation**

1. Course name:	
Practical cell biology	
2. Course code;	
Bio101a	
3. Semester/year	
: 2026-2025	
4. Date this description was prepared	
: 2025/11/2	
5. Available forms of attendance:	
Class attendance inside the classroom + attendance inside the laboratory + electronic classes on the Google platform classroom), It will be a supporting class for the attendance class and according to the controls and instructions of the Ministry of Higher Education and Scientific Research.	
6. Number of study hours (total) / number of units (total)	
60 hours/2 units	
7. Name of the course administrator (if more than one name is mentioned)	
Name: **Asst.lect Aya Jameel Rashid** Email:aya.jameel123@tu.edu	
8. Course objectives	
Objectives of the study subject	1- Developing students' ability to follow and understand speech Developing their ability to distinguish between main ideas And high school. 2- Urging students to obtain knowledge

	Information and the ability to draw conclusions. 3- Developing their abilities to make quick summaries Comprehensive aspects of the topic. 4-Introducing students to cell biology and the importance of the cell. 5-Cell diagnosis and classification. 6- Introducing the students to the types of cells and distinguishing between them.
	9. Teaching and learning strategies
It can be defined as a set of strategic rules. It can be defined as a set of general rules and broad lines that concern the means of achieving The desired goals of teaching refer to the methods and plans followed by faculty members to reach learning goals.	1-The standard method (giving lectures). 2-The method of discussion and interrogation. 3-Method of solving problems. 4-Brainstorming method.

Course description form

Course structure.10					
the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
-1	2		**General introduction** Modern theory of the cell Coupling between prokaryotic and eukaryotic cells Viruses	Standard method Text method	Standard method Text method

-2	2		**Chemical components of the cell** water Carbohydrates	Standard method Text method	Standard method Text method
-3	2		Amino acids, proteins and enzymes Fats	Standard method Text method	Standard method Text method
-4	2		Nucleotides and nucleic acids	Standard method Text method	Standard method Text method
-5	2		**Methods of studying the cell** Types of optical microscopes Electron microscopes	Standard method Text method	Standard method Text method
-6	2		**Study of living cells** **Study of dead cells**	Standard method Text method	Standard method Text method
-7	2		a–Cutting method b–Preparing the swab, preparing the mash c–Meticulous burning d–Centrifuges e–Radiant self–development f–Histochemistry	Standard method Text method	Standard method Text method

-8	2		**Cell membranes** A brief overview of the development of the study of biological membranes	Standard method Text method	Standard method Text method
-9	2		Mosaic fluid model Passage of materials through membranes Cytophagy	Standard method Text method	Standard method Text method
-10	2		Endoplasmic reticulum, its types and functions	Standard method Text method	Standard method Text method
-11	2		Golgi apparatus State bodies	Standard method Text method	Standard method Text method
-12	2		Microscopic bodies and their types Ribosomes	Standard method Text method	Standard method Text method
-13	2		Mitochondria Chloroplast–Light reactions and carbon dioxide fixation	Standard method Text method	Standard method Text method
-14	2		Central bodies, cilia and flagella	Standard method Text method	Standard method Text method
-15	2		Plastids, their classification, and the mechanism of photosynthesis	Standard method Text method	Standard method Text method
-16	2		Nucleus	Standard method	Standard method

				Text method	Text method
-17	2		The exact structure of the nucleus	Standard method Text method	Standard method Text method
-18	2		Chromosomes and their types	Standard method Text method	Standard method Text method
-19	2		Giant, brushy chromosomes	Standard method Text method	Standard method Text method
-20	2		Direct or non–filamentous division	Standard method Text method	Standard method Text method
-21	2		Mitosis	Standard method Text method	Standard method Text method
-22	2		Meiosis and reproductive cycle	Standard method Text method	Standard method Text method
-23	2		The importance of meiosis	Standard method Text method	Standard method Text method
-24	2		Study of the phenomenon of crossing	Standard method Text method	Standard method Text method
-25	2		Genetic mutation	Standard method Text method	Standard method Text method
-26	2		Reproduction of genetic information	Standard method Text method	Standard method Text method

-27	2		Protein construction	Standard method Text method	Standard method Text method
-28	2		Basic requirements for genetic engineering	Standard method Text method	Standard method Text method
-29	2		Study of cellular components under an electron microscope	Standard method Text method	Standard method Text method
-30	2		Study of cellular components under an electron microscope	Standard method Text method	Standard method Text method

11. Course evaluation
1- Formative or formative assessment (daily exams, class discussion, homework, attendance and regularity). 2--Grades for participating in difficult competitive questions are given to female students. 3- Diagnostic evaluation (semester and final exams to issue judgments of success and failure). 4- Qualitative and quantitative practical tests in laboratories. 5- Assigning female students to prepare scientific research to test their ability to think, deduce, and solve problems. 6-Field visits to the Central Research Laboratory.

7- Direct observation of female students' performance in the fields of dialogue, intellectual and scientific communication, and teamwork within the classroom and the college and university environment. 8- Distributing the grade out of 100 according to the tasks assigned to the student, such as daily attendance, the practical aspect, scientific reports, and daily, monthly, and final exams.	
12. Learning and teaching resources	
Required textbooks (methodology, if any)	Practical Cell biology / prepared by an elite group of professors from the Department of Life Sciences
Main references (sources)	Cell biology/Written by : Prof. Dr. Gabriel Barhoum Aziz
Recommended supporting books and references (scientific journals, reports...)	Scientific journals in scientific specializations
Electronic references, Internet sites	E-learning websites

Course Description Form

1. Course Name: Headway for 1st Year non-departmental
2. Course Code:
3. Semester / Year: 2025-2026
4. Description Preparation Date: 11/2/2026
5. Available Attendance Forms: Class lectures
6. Number of Credit Hours (Total) / Number of Units (Total): 60 hours / 2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Israa Burhanuddin Abdurrahman Email: israaburhan@tu. edu.iq
8. Course Objectives

Course Objectives	1. Enabling the students to: ❖ Read and write in English ❖ Follow the basic rules of the English language. ❖ Understand the ways of life in English-speaking societies, especially the British and American, and some of the differences between them. ❖ Communicate linguistically. ❖ Understand the language of films and the internet. 2. Teaching the students English language in smooth and simple manner. 3. Urging the students to solve the exercises and apply the rules. 4. Encouraging them to continue learning English language lessons by following programs in English and listening to conversation. 5. Developing the Students' skills in expressing himself

	and his ability to speak orally. 6. Developing the students' conversational skills and reading skills through the exercises in the student book

9. Teaching and Learning Strategies

Strategy	• The standard method (giving lectures). • The text method. • Brainstorming method. • Some modern strategies.

10. Course Structure

Week	Hours	Required Learn Outcomes	Unit or subject name	Learning method	Evaluation method
December 1 Unit Ten	1	Learning English sentences	Introduction use auxiliary /am/is/are In speaking and reading. Unit two: use the subjects /he/she/they/we/I/you In practice grammar.	Lecture	Oral Test
December 2 Unit Eleven	1	Learning the difference between active and passive sentences	using negative and positive on short answers and	Lecture	Oral Test
December 3 Unit Twelve	1	Learning the forms of verbs	Teaching present continuous	Lecture	Oral Test
December 4 Unit Thirteen	1	Learning tag questions with short answers	Teaching past continuous	Lecture	Oral Test
January 1 Unit Fourteen	1	Learning singular and plural	Teaching past simple – irregular verbs	Lecture	Oral Test

January 2	1	Learning forms of sentences in interrogative	teach past simple in using questions and negatives	Lecture	Oral Test
January 3	1	Learning forms of sentences in interrogative and negative	Using can in positive and negatives	Lecture	Oral Test
January 4	1	Learning forms of verbs	Teaching model verbs	Lecture	Oral Test
February 1	1	Learning English tenses	Teaching adverbs	Lecture	Oral Test
February 2	1	Learning short answers	using would like in questions	Lecture	Oral Test
March 1	1	Learning planning for future	Teaching some/any and the differences	Lecture	Oral Test
March 2	1	Learning planning for future	Teaching like and would like	Lecture	Oral Test
March 3	1	Learning planning for future	Teaching like and would like	Lecture	Oral Test
March 4	1	Learning the use of determiners	Teaching present simple and present continuous	Lecture	Oral Test
April 1	1	Learning short answers	Teaching Yes/No questions	Lecture	Oral Test
April 2	1	Learning clauses and forms of verbs	Teaching future plans	Lecture	Oral Test
April 3	1	Learning clauses	Teaching countable and uncountable	Lecture	Oral Test
April 4	1	Learning forms of interrogative sentences	Teaching the determiner the	Lecture	Oral Test
May 1	1	Learning the use of determiners	Teach the determiners a/an	Lecture	Written Test
May 2		Learning forms of prepositions	Teaching prepositions	Lecture	Written Test
May 3		Learning English	Teaching numbers	Lecture	

		numbers			
May 4			Teaching colours	Lecture	
June 1			Revision	Lecture	Written Test
June 2	1		Revision	Lecture	Written Test
June 3	-------		Exams	---------- --	----------

11. Course Evaluation

First Course:
Monthly Exam: 20
Daily homework: 5
Total: 25
Second Course:
Monthly Exam: 20
Daily homework: 5
Total: 25
Total for the 1st and 2nd Courses: 50
Final Exam: 50
Final Grade: 100

12. Learning and Teaching Sources

Required textbooks (curricular books, if any)	The Ministry's prescribed book Headway
Main references (sources)	----------
Recommended books and references (scientific journal, reports	
Electronic References, Websites	https://elt.oup.com/student/headway/beg/?cc=global&selLanguage=en. https://elt.oup.com/student/headway/preint4/?cc=global&selLanguage=en. https://elt.oup.com/student/headway/int/?cc=global&selLanguage=en. https://sc.nahrainuniv.edu.iq/lectures/7092_new-headway-upper-intermediate-students-book.pdf.

Course Description Form

1. Course Name: Virology
2. Course Code: bio 123
3. Semester / Year:Fourth
4. Description Preparation Date:2025/11/2
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total) 60\6
7. Course administrator's name (mention all, if more than one name)
Name: Suad Hammood Email: suad.hammood@tu.edu.iq

8. Course Objectives	
Course Objectives	Providing students with detailed information about virology including how the viruses classified , replication , Diagnosis and it's structures, etc… …..

9. Teaching and Learning Strategies	
Strategy	Standard method (automatic). -Text method. -Inductive (deductive) method. - How to solve problems.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	4 hours		introduction virus detection, definition , viruses properties	The standard method, the text method,	in class performance and exams
2	4 hours		viruses structures, capsid kinds enveloped virus and undeveloped virus	standard method How to solve problems	in class performance and exams
3	4 hours		viruses structures, capsid kinds enveloped virus and undeveloped virus	standard method How to solve problems	in class performance and exams
4	4 hours		virus replication depend on nucleic acid , Replication stages (Adhesion, Ponetration, Copying, assembly , release)	standard method How to solve problems	in class performance and exams
5	4 hours		virus replication depend on nucleic acid , Replication stages (Adhesion, Ponetration, Copying, assembly , release)	standard method How to solve problems	in class performance and exams
6	4 hours		Viruses Diagnosis Polymerase Chain Rection PCR	standard method How to solve problems	in class performance and exams
7	4 hours		viruses classified Bacterial, Plant, Animal viruses	standard method How to solve problems	in class performance and exams
8	4 hours		viruses Diagnosis Electron, scanning , transmission microscope, Serological methods and Elisa Technology	standard method How to solve problems	in class performance and exams
9	4 hours		Viruses Diagnosis Polymerase Chain Rection PCR	standard method How to solve problems	in class performance and exams
				standard method How to solve problems	in class performance and exams
				standard method How to	in class performance

				solve problems	and exams
10			Viruses Diagnosis Polymerase Chain Rection PCR	standard method How to solve problems	in class performance and exams
				Deductive method Method of solving problems	in class performance and exams
				standard method How to solve problems	in class performance and exams

Course Evaluations
Formative or formative assessment (daily exams, class discussion, homework assignments and their follow-up, classroom calendar).
-Diagnostic evaluation (50 semester exams and 50 final exams to issue judgments of success and failure)

Learning and Teaching Resources

Pleczar, M.J., E.C.S Chan and N.R. Krieg (1993) , Microbiology: Concepts and applications, McGraw Hill. INC. Pleczar, M.J., E.C.S Chan and N.R. Krieg (1993) Microbiology: Concepts and application, McGraw Hill. INC

Belshe, R.B. (1984). Human Virology. PSG. Publishing Com. INC.

Department Requirements	**56**	**122**		
Summer Training				
Other	**56**	**122**	**100**	

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
2025	Bio116	ecology	theoretical	practical
third stsge				

8. Expected learning outcomes of the program

Knowledge

Learning Outcomes 1 Learning Outcomes Statement 1

Skills

Learning Outcomes 2 Learning Outcomes Statement 2

Learning Outcomes 3 Learning Outcomes Statement 3

Statement 2 Learning Outcomes 3 Learning Outcomes

Statement 3 Ethics

Learning Outcomes 4 Learning Outcomes Statement 4

Learning Outcomes 5 Learning Outcomes Statement 5

Learning Outcomes 4 Learning Outcomes

Statement 4 Learning Outcomes S Learning Outcomes

Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

Course Description Form

1. Course Name:
Ecology and pollution
2. Course Code:bio116
Ecology and pollution/Stage
3. Semester / Year:
2025-2026 annual
4. Description Preparation Date:
2/11/2025
5. Available Attendance Forms:
Class lectures, electronic lectures, and practical laboratories
6. Number of Credit Hours (Total) / Number of Units (Total)
60 Hours /2 Unit
7. Course administrator's name (mention all, if more than one name)
Name: Nesreen Ekdam Abdalrahman Email: nesreen.e.abdalrahman@tu.edu.iq ..... Name:Enas moajale naife ..... Email: enas.moail467@tu.edu.iq .....
8. Course Objectives

Course Objectives	1- Developing students' ability to follow and understand speech Developing their ability to distinguish between main ideas And high school. 2- Urging students to obtain knowledge Information and the ability to draw conclusions. 3- Developing their abilities to

	make quick summaries Comprehensive aspects of the topic. 4- Introducing students to the Ecology, its importance and its harms. 5-Knowing the types of Ecology. 6- Introducing students to the types of pollution and distinguishing between them.

9. Teaching and Learning Strategies

Strategy	• Providing scientific knowledge for students and how to achieve it • Giving students the modern aspect of biology and learning about what is present in the animal kingdom

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Experience Methods of preparing chemical solutions and performing chemical calculations	Standard Method Text method	Descriptive Performance and examinations
2	2		Testing and estimating the concentration of sulphates in the air indirectly	Standard Method Text method	Descriptive Performance and examinations

3	2		Measuring the concentration of some air pollutants	Standard Method Text Method	Descriptive Performance and examinations
4	2		Examining and estimating the percentage of dust in the air in terms of plant pollution	Standard Method Text Method	Descriptive Performance and examinations
5	2		Scientific trip	Standard Method Text Method	Descriptive Performance and examinations
6	2		Measuring the concentration of dissolved oxygen in water	Standard Method Text Method	Descriptive Performance and examinations
7	2		Measurement of polluted and unpolluted water samples	Standard Method Text Method	Descriptive Performance and examinations
8	2		Measuring water salinity levels	Standard Method Text Method	Descriptive Performance and examinations

9	2		Measuring the amount of sulfates in water samples	Standard Method Text method	Descriptive Performance and examinations
10	2		Measurement of phosphate concentration in water and chemical detergents	Standard Method Text method	Descriptive Performance and examinations
11	2		Measurement of acidity and basicity in water	Standard Method Text method	Descriptive Performance and examinations
12	2		Study of algae as an indicator of organic pollution in water	Standard Method Text method	Descriptive Performance and examinations
13	2		The effect of soil contamination with chemical pesticides on seed germination	Standard Method Text method	Descriptive Performance and examinations
14	2		The effect of heavy metals on fish biology	Standard Method Text method	Descriptive Performance and examinations

11. Course Evaluation

12. Learning and Teaching Resources	
any)	pollution/Prepared by an elite group of professors from the Department of Life Sciences
Main references (sources)	Environment and practical pollution / Dr. Bahram Khader was born D. Hussein Ali Al-Saadi D. Hussein Ahmed Sharif Al-Azami
Recommended supporting books and references (scientific journals, reports...)	Scientific journals in scientific specializations
Electronic references, Internet sites	E-learning websites

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

Course Description Form

١. Course name :	
Scientific research methodology	
٢. Course code:	
Bio126a	
٣. Year/ Semester:	
Year	
٤. Date this description was prepared	
٢٠٢٦/١١	
٥. Available attendance forms :	
My presence	
٦. Number of study hours (total) / Number of units (total):	
Total number of hours (٤٦) / number of units (٤)	
٧. Name of the course administrator (if more than one name is mentioned)	
Araf Sabah Abdulwahed	
٨. Course objectives	
١. Understanding the theoretical foundations of scientific research: **٢. Acquire research design skills:** **٣. Developing data collection skills:** **٤. Enhancing scientific and critical analysis:**	**٥. Learn the rules of writing scientific research:** **٦. Instilling the principles of scientific research ethics:** **٧. Stimulate critical and creative thinking:** **٨. Enhancing the ability to work in a team:** **٩. Preparing the researcher for the labor market or postgraduate studies:** **١٠. Proper use of artificial intelligence tools**
٩. Teaching and learning strategies	
١. Lectures **Interactive** ٢. **Problem** (PBL-Based Learning)	٤. **Learning** Collaborative ٦. **Use of educational technology** ٧. **Literature Review** Sessions

٨. **Task** Based Learning-	٣. **Workshops**

١٠. Course structure

Evaluation method	Learning method	Unit or subject name	Required Learning Outcomes	Hours	Week
questions short tests	My presence	Definition of science The origin and development of science	Understanding what science is And its importance in Interpretation of phenomena Natural .And social	٢	١
questions short tests	My presence	Modern : science Objectives of science	Goal analysis Modern Science And its role in Progress .Technological	٢	٢
questions short tests	My presence	The difference between science And knowledge Scientific - thinking And its basics	Distinguish between The two concepts and understand the relationship .Between them	٢	٣
questions short tests	My presence	Scientific research And its relationship - with science Evolution of the	Understanding Evolution Historical to publish Research And its various .means	٢	٤

		concept of publishing Scientific research			
questions short tests	My presence	Scientific research- The article Short article- study - Reports Patents Postgraduate Theses	Get to know Types of writing Scientific and when ?How is it done .Use it	٢	٥
questions short tests	My presence	Research plan and ,hypotheses the problem Identify the problem Preparing a research plan	Learn how to identify Research problem And put Assumptions .The occasion	٢	٦
questions short tests	My presence	Scientific research methods and tools Survey methodology and its tools	Get to know Scientific curricula Different like Descriptive And the Messiah And .experimental	٢	٧
questions short tests	My presence	Descriptive approach and ,its tools approach Experimental and its tools	Learn how to Description of phenomena And study it Using .This approach	٢	٨
questions short tests	My presence	Theoretical mathematical approach	Get to know Use Models	٢	٩

		Statistical method is a .study method ,case comparative approach	Sports in Scientific .research		
questions short tests	My presence	Main requirements for completion Research Experimental Methodology	Learn to apply Methods Statistics To analyze .data	٢	١٠
questions short tests	My presence	Simple , experiments experiments Factors , compound syllabus samples Experimental	Gaining ability on Design a research plan .methodology	٢	١١
questions short tests	My presence	Errors in scientific experiments Types of errors and their sources	Get to know Types of errors and their sources .To avoid it	٢	١٢
questions short tests	My presence	, sources sources ,Written electronic resources and automated retrieval	Learn how to find and use reliable .information	٢	١٣
questions short tests	My presence	Internet International Information Network	Using the Internet as a source of information and managing	٢	١٤

			electronic .research		
questions short tests	My presence	Scientific research writing title , writing style Rules for writing terms and names Branching	Gain organized scientific .writing skills	٢	١٥
questions short tests	My presence	Writing down the main paragraphs of the research ,Introduction Signaling Methods To the reference	Organize research content into .clear sections	٢	١٦
questions short tests	My presence	Writing a paragraph on materials and methods of work And types of samples	Write the work steps clearly and .systematically	٢	١٧
questions short tests	My presence	Recording the results ,paragraph preparation controls Tables and discussion notes The bottom line	Present results using tables and charts in an organized .manner	٢	١٨
questions short tests	My presence	Preparing a list ,of references	Identify different documentation	٢	١٩

		And ways to record it	styles and prepare a .reference list		
questions short tests	My presence	Reference Card System	Organize references using cards or electronic .systems	٢	٢٠
questions short tests	My presence	Linear illustrative forms Curves, Types of Graphs	Use graphs to .illustrate data	٢	٢١
questions short tests	My presence	Scattered , shapes column shapes Repetitive terraces	scatter plots to show the relationship between two numerical variables and understand how to interpret the distribution and pattern between .points	٢	٢٢
questions short tests	My presence	Photographs And its characteristics	Learn how to use photographs as a visual medium to document data .or phenomena	٢	٢٣
questions short tests	My presence	Final output of the research	Professionally prepare research for publication or .presentation	٢	٢٤
Course Evaluation .١١					

Learning and teaching resources .١٢	
Methodological books Scientific research methodology study For science curricula with focus on: _ Method / Written by Muthanna Abdul Razzaq Baghdad: College of Education for Girls, ٢٠٠١	Required textbooks (methodology if any)
.١ .(١٩٨٦) .Al-Siraqusi , Lazmi Ahmed Mustafa .Title: Introduction to science curricula .Publisher: Dar Al Thaqafa for Printing and Publishing .Location: Cairo .٢ .(٢٣٣٣) .Age, Muthanna Abdul Razzaq Al-Omar Title: Originality in Scientific Research: A .Contemporary Problem in Iraq ,Source: Journal of the Scientific Academy, Part Four .Volume Forty-Seven .Pages: ١٣٣-١٤٢ Ritterger,M and W.Ritter berges (1997) Measuring quality in the Production of datd bens Journal of Information Science 23(1)pp 25 -37	Main References (Sources (
	Recommended supporting books and references (scientific .(journals, reports, etc
Artificial Intelligence Tools	, Electronic references websites

Course Description Form

1. Course Name:
Genetics
2. Course Code:
Bio115a
3. Semester / Year:
2025
4. Description Preparation Date:
2025/11/2
5. Available Attendance Forms:
Class lectures + electronic lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours
7. Course administrator's name (mention all, if more than one name)

Halah Hashim Halah.hashime@tu.edu.iq

8. Course Objectives	
Course Objectives	Genetics aims to: 1- Enhancing understanding of the basic concepts of heredity and genes. 2- Developing scientific research and analysis skills. 3- Applying genetic knowledge in fields such as medicine and agriculture. 4- Promoting awareness of the ethical and social challenges associated with genetics. 5- Encouraging critical thinking and

	innovation in scientific solutions

9. Teaching and Learning Strategies	
Strategy	Providing psychological motivation to achieve scientific goals Cooperative learning, problem-based learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Standard method, text method	Mendelian inheritance/ Introduction, the law of isolation, the law of free distribution and their cytological interpretation.	Understand the lecture topic	Class performance and exams
2	2	Standard method, text method	Expansion of inferred inheritance: incomplete dominance, co-dominance, lethal genes, overlapping gene action, multiple mechanisms, inheritance and sex, Accessibility and gene expression.	Understand the lecture topic	Class performance and exams
3	2	Standard method, text method	Quantitative inheritance: the importance of multiple genes, genetic equivalents, twins	Understand the lecture topic	Class performance and exams
4	2	Standard method, text method	Genetic linkage and crossing: incomplete linkage, crossing mechanism, factors affecting crossing,	Understand the lecture topic	Class performance and exams

			how to draw a genetic map. For eukaryotic organisms, comparison between crossover and exchange between sister chromatids.		
5	2	Standard method, text method	Methods for the emergence of new genetic structures in bacteria. Sex chromosomes and sex assignment in different organisms.	Understand the lecture topic	Class performance and exams
6	2	Standard method, text method	Chromosomal mutations, chromosomal abnormalities in humans.	Understand the lecture topic	Class performance and exams
7	2	Standard method, text method	Cytoplasmic inheritance and maternal influence, shell wrapping in the shell of Limnaea , Kappa in Paramecium, mutations in DNA	Understand the lecture topic	Class performance and exams
8	2	Standard method, text method	Synthesis and molecular analysis of the hereditary material, DNA, experiments to prove that DNA is the hereditary material and that RNA is the hereditary material in some filters.	Understand the lecture topic	Class performance and exams
9	2	Standard method, text method	Replicate DNA: proof that replication occurs in a semi-conservative manner, replication	Understand the lecture topic	Class performance and exams

			enzymes, the role of DNA in replication, reverse transcription in DNA filtrate, cutting and modification processes in its three types.		
10	2	Standard method, text method	Translation, protein synthesis, genetic code and its characteristics, auxiliary factors, construction of the peptide chain, The theory of one gene, one polypeptide chain, develops hereditary control of metabolic processes.	Understand the lecture topic	Class performance and exams
11	2	Standard method, text method	Regulation of gene expression in prokaryotes. Regulation of gene expression in eukaryotes.	Understand the lecture topic	Class performance and exams
12	2	Standard method, text method	Genetic mutation: its types according to molecular changes, spontaneous mutation, the creation of mutations by radiation and some chemicals, damage repair systems in DNA. Transposable elements	Understand the lecture topic	Class performance and exams
13	2	Standard method, text method	Genomics: Structure of chromosomes and organization of DNA sequences in	Understand the lecture topic	Class performance and exams

			them, extraction and analysis of DNA for clones, application of some genetic technology such as genetic engineering in diagnosing some hereditary diseases, sorting DNA fingerprints, and completing the human genome project.		
14	2	Standard method, text method	Constitutional inheritance: programmed cell death. How the specialized state unfolds from the genome The object. Population genetics: genetic reservoirs, Hardy's law, Weinberg's law Gene redundancy and factors affecting it.	Understand the lecture topic	Class performance and exams
15	2	Standard method, text method	Inheritance and evolution: chromosomal changes and their relationship to the emergence of species with double chromosome numbers.	Understand the lecture topic	Class performance and exams

12. Learning and Teaching Resources	
Learning Resources	Cell and Genetics - Part Two Written by: Dr. Saad Jaber Taj Al-Din & Dr. Abdulnabi Hadi Al-Issa. Second edition 2000

Main references (sources)	Main references (sources) Genetics, written by Dr. Makram Diya Shakara, fourth edition 2009 Cell Science and Genetics Author Saad Hussein Al-Qahtani Year of Publication 2013 Foundations of Genetics, written by Irwin H. Herskovits 1983 Basics in genetics, written by Dr. Adnan Hassan Muhammad Al-Adhari, Mosul University Press

Course Description Form

1. Course Name:	
General chemistry Practical/ 1st year	
2. Course Code:	
3. Semester / Year:	
Annual / 2025-2026	
4. Description Preparation Date:	
2/11/2025	
5. Available Attendance Forms:	
Class attendance + electronic classes (Google Classroom), which will be a supporting class for the in-person class, and according to the conditions and instructions of the Ministry of Higher Education and Scientific Research.	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120 hours per year / 6 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Lecture Dr. Marwan Thaer Jalal Email: marwan.analytical@tu.edu.iq	
8. Course objectives	
Course objectives	• Providing students with knowledge of the principles of analytical chemistry one of the basic branches of chemistry. • Developing students' ability by knowing the most important scientific concepts and rules that must be followed to understand the mechanisms of chemical reactions and how to control them. • Teaching students how to use and apply laws in the practical aspect. • Preparing students to practice the career of teaching chemistry in the academic institutions.
9. Teaching and Learning Strategies	
Strategy	1- Standard method (lectures). 2- Discussion and Questioning method. 3- practical method.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Sep. 3	٦	Elocution and Discussion Methods	Separation methods	Standard and practical method	Class performance and exams
Sep. 4	٦	Elocution and Discussion Methods	Extraction of natural products	Standard and practical method	Class performance and exams
Oct. 1	٦	Elocution and Discussion Methods	Chemical equilibrium	Standard and practical method	Class performance and exams
Oct. 2	٦	Elocution and Discussion Methods	Ionic equilibrium-calculation PH, POH	Standard and practical method	Class performance and exams
Oct. 3	٦	Elocution and Discussion Methods	Hydrolysis of salts-calculation PH	Standard and practical method	Class performance and exams
Oct. 4	٦	Elocution and Discussion Methods	Examination	Standard and practical method	Class performance and exams
Nov. 1	٦	Elocution and Discussion Methods	The common ion action-buffer solutions-calculation PH	Standard and practical method	Class performance and exams
Nov. 2	٦	Elocution and Discussion Methods	Methods expressing analytical concentrations	Standard and practical method	Class performance and exams
Nov. 3	٦	Elocution and Discussion Methods	Standard solutions-standard substances	Standard and practical method	Class performance and exams
Nov. 4	٦	Elocution and Discussion Methods	Neutralization reactions	Standard and practical method	Class performance and exams
Des. 1	٦	Elocution and Discussion Methods	Neutralization reactions –used indicators	Standard and practical method	Class performance and exams
Des. 2	٦	Elocution and Discussion Methods	Precipitation reactions	Standard and practical method	Class performance and exams
Des. 3	٦	Elocution and Discussion Methods	Precipitation titrations	Standard and practical method	Class performance and exams
Des.4	٦	Elocution and Discussion Methods	Precipitation titrations used in volumetric analysis	Standard and practical method	Class performance and exams
Jan. 1	٦	Elocution and Discussion Methods	Gravimetric analysis	Standard and practical method	Class performance and exams
Jan. 2	٦	Elocution and Discussion Methods	Examination	Standard and practical method	Class performance and exams

Jan/ 3	Spring holiday				
Jan. 4					
Feb. 1	٦	Elocution and Discussion Methods	Introduction	Standard and practical method	Class performance and exams
Feb. 2	٦	Elocution and Discussion Methods	Chemical bonding in carbon compounds	Standard and practical method	Class performance and exams
Feb. 3	٦	Elocution and Discussion Methods	Polar molecules and non-polar molecules	Standard and practical method	Class performance and exams
Feb. 4	٦	Elocution and Discussion Methods	Single bonds- double bonds-triple bonds	Standard and practical method	Class performance and exams
Mar. 1	٦	Elocution and Discussion Methods	Stereochemistry	Standard and practical method	Class performance and exams
Mar. 2	٦	Elocution and Discussion Methods	Nomenclature of organic compounds	Standard and practical method	Class performance and exams
Mar.3	٦	Elocution and Discussion Methods	Examination	Standard and practical method	Class performance and exams
Mar. 4	٦	Elocution and Discussion Methods	Alkanes- structure - nomenclature	Standard and practical method	Class performance and exams
Apr. 1	٦	Elocution and Discussion Methods	Preparation- reactions	Standard and practical method	Class performance and exams
Apr. 2	٦	Elocution and Discussion Methods	Alkenes- structure - nomenclature	Standard and practical method	Class performance and exams
Apr. 3	٦	Elocution and Discussion Methods	Preparation- reactions	Standard and practical method	Class performance and exams
Apr. 4	٦	Elocution and Discussion Methods	Alkynes - structure - nomenclature	Standard and practical method	Class performance and exams
May 1	٦	Elocution and Discussion Methods	Preparation- reactions	Standard and practical method	Class performance and exams
May 2	٦	Elocution and Discussion Methods	Aromatic hydrocarbons-benzene -reactions	Standard and practical method	Class performance and exams
May 3	٦	Elocution and Discussion Methods	Alcohols-Alkyl halides	Standard and practical method	Class performance and exams
May 4	٦	Elocution and Discussion Methods	Examination	Standard and practical method	Class performance and exams

June 1			Final Exams		

11. Course Evaluation
1- Formative evaluation through daily exams, observing the student's performance in class discussions and homework assignments, and classroom evaluation. This grade does not exceed 20% of the total. 2- Diagnostic evaluation by semester and final exams to issue judgments of success and failure. This grade is 80% and is divided into (4) semester exams during the year, that is, two exams for each semester, to extract the annual quest before entering the final exams.

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1-Foundations of Analytical Chemistry: Written by Dr. Moayad Qasim Al-Abaiji and Dr. Thabet Saeed Al-Ghabsha, 1986. 2-Organic Chemistry, Written by Dr. Khalid Mahmood Dawood
Main references (sources)	1-Descriptive and volumetric analysis: written by Dr. Thabet Saeed Al-Ghabsha and Dr. Moayed Qasim Al-Abaiji, 1989. 2-Theoretical foundations of inorganic analytical chemistry, quantitative gravimetric and volumetric analysis: written by Dr. Hadi Kazem Awad and others, 1986. 3- Journal of Analytical Chemistry. 4-Journal of Chemical Africa. 5-Talanta.
Electronic References, Websites	1-Chemistry Dictionary. 2-Material Safety Data Sheet. 3-The Merck Index. 4-Publisher Springer https://www.Sprenger.com/. 5-Publisher Elsevier https://www.Scopus.com/. 6-Google Scholar https://scholar.google.com/.

	7-Academia https://www.Academia.com/ 8-Research Gate https://www.researchgate.net/. 9- Science Direct https://www.sciencedirect.com/.

Course Description Form

1. Course Name:	
Animal physiology	
2. Course Code:	
3. Semester / Year:	
2024 - 2025/first and second semester	
4. Description Preparation Date:	
18- 1- 2025	
5. Available Attendance Forms:	
Class lectures	
6. Number of Credit Hours (Total) / Number of Units (Total)	
42	
7. Course administrator's name (mention all, if more than one name)	
Name: or. Dr. Iktifaa Abdel Hamid Mohammed Saeed Email: Iktifaa_kumait@tu.edu.iq	
8. Course Objectives	
Course Objectives	1_ Helping students understand the physiology of the organs found in body. 2_ Preparing scientific and qualitative staff specialized in the field of science Life for the purpose of improving the educational situation in the country. 3_ Teaching students writing and speaking skills at all levels Analytical by referring to the latest findings of modern science in The field of animal physiology. 4_ The program serves the university by providing students with higher education Quality by reviewing the latest research results Scientific developments at the theoretical and practical levels. 5_ The Ministry of Education and the Ministry of Higher Education and Scientific Research With specialized staff with competence in the field of life sciences
9. Teaching and Learning Strategies	

Strategy	1_ Using the method of lecture, interrogation and discussion 2_ Assigning students to do research and reports. 3_ Assigning students to do assignments related to the scientific subject.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Physiology and its general principles Physiology of the nervous system	Lecture and interrogation	Class performance
2-3	4		Muscular system physiology	Lecture and discussion	Class performance
4	2		Respiratory system physiology	Lecture and discussion	Class performance
5-6	4		Physiology of the circulatory system	Lecture and interrogation	Class performance
7-8	4		Lymphatic system	Lecture and discussion	Class performance

9-10	4		Physiology of the nervous system	Lecture and interrogation	Class performance
11-12	4		Digestive system	Lecture and discussion	Class performance
13-14	4		The physiological effect of heat Energy metabolism	Lecture and interrogation	Class performance
15-16	4		Kidney and fluid regulation Physical	Lecture and discussion	Class performance
17-18	4		Endocrine glands	Lecture and interrogation	Class performance
19-20-21	6		Physiology of the reproductive system	Lecture and discussion	Class performance

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Mycology
2. Course Code:
Mycology / Third stage
3. Semester / Year:
2025
4. Description Preparation Date:
/11/2025
5. Available Attendance Forms:
Class Lecture + electronic lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
90 hourse
7. Course administrator's name (mention all, if more than one name)
Roaahassan@tu.edu.iq الاسم م.د رؤى حسن الطيف
8. Course Objectives

Course Objectives	• ..... • ..... • .....

9. Teaching and Learning Strategies	
Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

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

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Mycology
2. Course Code:
Mycology / Third stage
3. Semester / Year:
2025
4. Description Preparation Date:
2/11/2025
5. Available Attendance Forms:
Class Lecture + electronic lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
90 hourse
7. Course administrator's name (mention all, if more than one name)
Name :Balqees osama Email :balqees.Mohammed@tu.edu.iq .....
8. Course Objectives

Course Objectives	• ..... • •

9. Teaching and Learning Strategies	
Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

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

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name: Practical embryology

2. Course Code: Bio111

3. Semester / Year:Second

4. Description Preparation Date:2 \11\2025

5. Available Attendance Forms: Educational laboratory

6. Number of Credit Hours (Total) / Number of Units (Total) 60\6

7. Course administrator's name (mention all, if more than one name)

Name:
Israa Abdel Moneim Mohamed israa.mohammed@tu.edu.iq

8. Course Objectives

Course Objectives	Providing students with detailed information about practical embryology, including how the embryos of some selected animal models grow using prepared sections on glass slides to be examined under a light microscope, or preserved models.

9. Teaching and Learning Strategies

Strategy	Standard method (automatic). -Text method. -Inductive (deductive) method. - How to solve problems.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October1	2		The introduction	The standard method, the text method,	in class performance and exams
October2	2		Serial sections	standard method How to solve problems	in class performance and exams

October3	2		Gametogenesis	standard method How to solve problems	in class performance and exams
October4	2		Sperm formation	standard method How to solve problems	in class performance and exams
November 1	2		Egg formation	standard method How to solve problems	in class performance and exams
November 2	2		Oviduct	standard method How to solve problems	in class performance and exams
November 3	2		Uterus	standard method How to solve problems	in class performance and exams
November 4	2		Fertilization	standard method How to solve problems	in class performance and exams
December 1	2		Cleavage	standard method How to solve problems	in class performance and exams
December 2	2		Blastula formation	standard method How to solve problems	in class performance and exams
December 3	2		Gastrulation formation	standard method How to solve problems	in class performance and exams
December 4	2		Gastrulation formation	standard method How to solve problems	in class performance and exams
January 1	2		Embryonic formation of the Amphioxus Lanceolatus	Deductive method Method of solving problems	in class performance and exams
January 2	2		Embryonic formation of the Amphioxus Lanceolatus	standard method How to solve problems	in class performance and exams
January 3	2		Embryonic formation of the Amphioxus Lanceolatus	standard method How to solve problems	in class performance and exams
January 4	2		Embryonic formation of the frog	standard method How to solve problems	in class performance and exams
February 1	2		Embryonic formation of the frog	standard method How to solve problems	in class performance and exams
February 2	2		Embryonic formation of the frog	standard method How to solve problems	in class performance and exams
March 1	2		Embryonic formation of the frog	standard method How to solve problems	in class performance and exams

March 2	2		Embryonic formation of chickens	standard method How to solve problems	in class performance and exams
March 3	2		Embryonic formation of chickens	standard method How to solve problems	in class performance and exams
March 4	2		Embryonic formation of chickens	standard method How to solve problems	in class performance and exams
April 1	2		Embryonic formation of chickens	standard method How to solve problems	in class performance and exams
April 2	2		Artificial insemination	standard method How to solve problems	in class performance and exams
April 3	2		Overall preparation of chicken embryo	standard method How to solve problems	in class performance and exams
April 4	2		Cross sections of chicken embryo	standard method How to solve problems	in class performance and exams
May 1	2		The brooder	standard method How to solve problems	in class performance and exams
May 2			General Review	How to solve problems	
May 3,4			final exams		

cource Evaluations
Formative or formative assessment (daily exams, class discussion, homework assignments and their follow-up, classroom calendar).
-Diagnostic evaluation (50 semester exams and 50 final exams to issue judgments of success and failure)

Learning and Teaching Resources
Embryology - Planets Abdul Qadir Al-Mukhtar
Medical Embryology - Richard Snell Translated by Talee Bashour
Scientific journals issued by colleges of medicine, veterinary medicine, and science
Scientific, medical and health websites

Course Description Form

1. Course Name:
Insect Sience
2. Course Code:
Insect Sience /Third stage
3. Semester / Year:
2025-2026
4. Description Preparation Date:
2/11/2025
5. Available Attendance Forms:
Class attendance inside the classroom + attendance inside the laboratory + electronic classes on the (Google Classroom) platform, which will be a supporting class for the in-person class, according to the controls and instructions of the Ministry of Higher Education and Scientific Research
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours
7. Course administrator's name (mention all, if more than one name)
Dr.Thabet Mudheher Khalaf Email:Dr.thabit@tu.edu.iq Assistant Teacher Zahra Khalil Asmail Email: zkhalil@tu.edu.iq
8. Course Objectives

Course Objectives	.....
	Introducing the student to all parts and types of insects • 2. The student knows the difference between harmful and beneficial insects • 3. Introducing the student to the components of the insect's internal systems • 4. Introducing the student to entomology and its relationship to other sciences

9. Teaching and Learning Strategies

Strategy	Providing psychological motivation to achieve scientific goals Providing modern scientific lectures that keep pace with developments and from various sources

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understanding the ideas of the topic and being able to apply it with examples	General introduction, definition of entomology, the importance of insects, and the relationship of insects with humans and animals	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
2	2	Understanding the ideas of the topic and being able to apply it with examples	Sciences related to entomology	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
3	2	Understanding the ideas of the topic and being able to apply it with examples	The presence of insects, the reasons for their success and spread, and important sources	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
4	2	Understanding the ideas of the topic and being able to apply it with examples	Location of insects in the animal kingdom, comparing insects with other types	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
5	2		General characteristics of the external appearance of the body wall, its areas and benefits	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests

6	2	Understanding the ideas of the topic and being able to apply it with examples	Areas of the body: the head, its types, mouth parts, their definition, and study of mouth parts mutations	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
7	2	Understanding the ideas of the topic and being able to apply it with examples	Eyes, their types, compound and simple, and the structure, number, and arrangement of eyes	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
8	2	Understanding the ideas of the topic and being able to apply it with examples	Tentacles: their definition, composition, types and benefits	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
9	2	Understanding the ideas of the topic and being able to apply it with examples	The chest has its rings, the composition of the wingless and winged chest	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
10	2	Understanding the ideas of the topic and being able to apply it with examples	Legs, their types, components and benefits. Wings, their types. Flight mechanics and wing clamping devices.	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
11	2	Understanding the ideas of the topic and being able to apply it with examples	The abdomen, the number of rings, their arrangement, and their areas. The external reproductive organs of males and females	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
12	2	Understanding the ideas of the topic and being able to apply it with examples	Internal anatomy of the digestive system and its appendages	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests

13	2	Understanding the ideas of the topic and being able to apply it with examples	The nervous system and its types	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
14	2	Understanding the ideas of the topic and being able to apply it with examples	The respiratory system and its types	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
15	2	Understanding the ideas of the topic and being able to apply it with examples	The blood circulatory system, its components and blood functions	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
16	2	Understanding the ideas of the topic and being able to apply it with examples	Sense organs, mechanical receptors, hearing organs, chemical receptors, organs of sight, organs for sensing temperature and humidity.	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
17	2	Understanding the ideas of the topic and being able to apply it with examples	Growth and transformation stages: immature stages The egg, the juvenile, the nymph, the larva and its types, the pupa, and the definition of metamorphosis and its types Methods of reproduction in insects	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests

18	2	Understanding the ideas of the topic and being able to apply it with examples	The method of understanding between insects, between individuals of the same species, between individuals of different species, pheromones, sounds, and movements	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
19	2	Understanding the ideas of the topic and being able to apply it with examples	Insect classification, taxonomy, its definition, types, and historical stages	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
20	2	Understanding the ideas of the topic and being able to apply it with examples	Binary scientific nomenclature and its laws	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
21	2	Understanding the ideas of the topic and being able to apply it with examples	The concept of species, subspecies, and primary and secondary taxonomic ranks. Basis of classification and basic characteristics. Different ranks.	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
22	2	Understanding the ideas of the topic and being able to apply it with examples	The most important insect orders from an economic standpoint	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
23	2	Understanding the ideas of the topic and being able to apply it with examples	Honey bees, their benefits, diseases, definition of the colony, its characteristics, division of labor among the colony members	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests

24	2	Understanding the ideas of the topic and being able to apply it with examples	The concept of insect pest control and its types	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
25	2	Understanding the ideas of the topic and being able to apply it with examples	Hormones, definition of the hormone, youth hormone, how it works, moulting hormone, how it works	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
26	2	Understanding the ideas of the topic and being able to apply it with examples	The role of hormones in insect control recently	In-person education Blackboard lecture + demonstrations	Daily attendance, oral questions and tests
27					

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Embryology
2. Course Code:
3. Semester /
Year:Second 2025-2026
4. Description Preparation Date:
2\11\2025
5. Available Attendance Forms:
Classrooms
6. Number of Credit Hours (Total) / Number of Units (Total)
60\6
7. Course administrator's name (mention all, if more than one name)
Name: Israa Hashem Ali Email:iAli@tu.edu.iq
8. Course Objectives

Course Objectives	Providing students with detailed information about embryology, including a historical overview of the emergence of this science or its historical development, the factors influencing it and its most important elements, learning about the concept of embryology and its relationship to other sciences, studying modern theories and the most important modern discoveries, and everything related to the growth and development of the fetus.

9. Teaching and Learning Strategies

Strategy	Standard method (automatic). -Text method. -Inductive (deductive) method. - How to solve problems.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October 1	2		The introduction	The standard method, the text method,	in class performance and exams
October 2	2		History of	The standard method, the text	in class performance

			embryology	method,	and exams
October 3	2		Theories of embryogenesis	The standard method, the text method,	in class performance and exams
October 4	2		Fields of embryology	The standard method, the text method,	in class performance and exams
November 1	2		Sperm formation	standard method How to solve problems	in class performance and exams
November 2	2		Egg formation	standard method How to solve problems	in class performance and exams
November 3	2		Sexual cycles	standard method How to solve problems	in class performance and exams
November 4	2		Fertilization	standard method How to solve problems	in class performance and exams
December 1	2		Parthenogenetic reproduction	standard method How to solve problems	in class performance and exams
December 2	2		Cleavage	standard method How to solve problems	in class performance and exams
December 3	2		Blastula formation	standard method How to solve problems	in class performance and exams
December 4	2		Gastrulation formation	standard method How to solve problems	in class performance and exams
January 1	2		Destiny maps	Deductive method Method of solving problems	in class performance and exams
January 2	2		Form-forming movements	standard method How to solve problems	in class performance and exams
January 3	2		Growth and differentiation	standard method How to solve problems	in class performance and exams
January 4	2		Embryonic induction	standard method How to solve problems	in class performance and exams
February 1	2		Embryonic formation of the Amphioxus Lanceolatus	standard method How to solve problems	in class performance and exams
February 2	2		Amphibian embryos	standard method How to solve problems	in class performance and exams
March 1	2		Embryonic	standard method How to solve	in class performance

			formation of the frog	problems	and exams
March 2	2		Bird embryos	standard method How to solve problems	in class performance and exams
March 3	2		Embryonic formation of chickens	standard method How to solve problems	in class performance and exams
March 4	2		Stem Cells	standard method How to solve problems	in class performance and exams
April 1	2		Apoptosis	standard method How to solve problems	in class performance and exams
April 2	2		Twins	standard method How to solve problems	in class performance and exams
April 3	2		Congenital malformations	standard method How to solve problems	in class performance and exams
April 4	2		Artificial insemination	standard method How to solve problems	in class performance and exams
May 1	2		Placenta	standard method How to solve problems	in class performance and exams
May 2				How to solve problems	
May 3,4					

Course Description Form

1. Course Name:
Practical histology
2. Course Code:
Second stage \ Bio108a
3. Semester / Year:
2025-2026 annual
4. Description Preparation Date:
2 /11/2025
5. Available Attendance Forms:
Class lectures, electronic lectures, and practical laboratories
6. Number of Credit Hours (Total) / Number of Units (Total)
60 Hours /2 Unit
7. Course administrator's name (mention all, if more than one name)
Shireen adil ali Zina Kanaan Hussain sheren.ali@tu.edu.iq zina.kanaan@tu.edu.iq .....
8. Course Objectives

Course Objectives	..... **troducing the students to the construction of a microscope and its use in laboratories** **ntroducing the students to some laboratory tools and equipment** *** Introducing the students to some examples of the branches of the animal kingdom**

9. Teaching and Learning Strategies	
Strategy	**• Providing scientific knowledge for students and how to achieve it** **• Giving students the modern aspect of biology and learning about what is present in the animal kingdoms**
10. Course Structure	

Week	Hours	Required Learning	Unit or subject name	Learning method	Evaluation
		Outcomes			method
1	2		Introduction: Section One: Primary tissues	The standard method, the text method,	in class performance and exams
2	2		Epithelial tissues (covering and lining): their characteristics and classification	standard method How to solve problems	in class performance and exams
3	2		Glandular epithelial tissue: definition and classification	standard method How to solve problems	in class performance and exams
4-5	2		Connective tissues: their features, elements, and classification	standard method How to solve problems	in class performance and exams
6-7	2		Native connective tissues and specialized connective tissues (cartilage, bone, blood, lymph, hematopoietic tissue)	standard method How to solve problems	in class performance and exams
8	2		Muscle tissue: smooth muscle, skeletal muscle, cardiac muscle	standard method How to solve problems	in class performance and exams
9-10	2		Nervous tissue: nerve cell, types of nerve cells, nervous mechanisms, glial cells, nerve cord, cerebellum	standard method How to solve problems	in class performance and exams
11-12	2		Section Two: Organ tissue/circulatory system: capillaries, arteries, veins, heart	standard method How to solve problems	in class performance and exams
13	2		Integumentary system: skin, hair, nail	standard method How to solve problems	in class performance and exams
14-15-16	2		Digestive system: mouth (lip, tongue, tooth), digestive tube (esophagus, stomach, small and large intestine), digestive glands (liver, pancreas)	standard method How to solve problems	in class performance and exams
	2		Digestive system: mouth (lip, tongue, tooth), digestive tube (esophagus, stomach, small and large intestine), digestive glands (liver, pancreas)	standard method How to solve problems	in class performance and exams

17-18	2		Respiratory system: trachea, bronchus, lung	standard method How to solve problems	in class performance and exams
19-20	2		Urinary system: kidney, ureter	Deductive method Method of solving problems	in class performance and exams
21-22-23	2		Lymphatic system: lymph nodes, thymus, spleen	standard method How to solve problems	in class performance and exams

11. Course assessment

1- Formative assessment (daily quizzes/tests, class discussions, homework assignments, attendance and regularity).
2- 2- Grades are allocated for students' participation, challenging competitive questions.
3- 3- Diagnostic assessment (midterm and final exams to determine pass/fail decisions).
4- 4- Qualitative and quantitative practical tests in laboratories.
5- 5- Assigning students to prepare scientific research papers to assess their ability to think, infer, and solve problems. 6- Field visits to the Central Research Laboratory.
6- 7- Direct observation of students' performance in areas of dialogue, intellectual and scientific communication, and teamwork within the classroom and the college/university environment.
7- 8- Distributing the grade out of 100 according to the tasks assigned to the student, such as daily attendance, practical component, scientific reports, daily/monthly/final exams.

8- Learning and teaching resources Required textbooks (syllabus if available):

* Textiles Science Vol.1 and Vol.2 / Dr. Kawkab Abdulqadir Al-Mukhtar Main references (sources):

* Basic Histology (Junqueira, L.C. and Carneiro, J., 2016) Recommended supporting books and references (scientific journals, reports...): Assiut Veterinary Medicine Journal Electronic references, websites: Embryology and Histology Arabic www.jarir.com

Course Description Form

1. Course Name: Microbiology	
2. Course Code: Bio 121	
3. Semester / Year:2025	
4. Description Preparation Date: 2/11/2025	
5. Available Attendance Forms: Class attendance inside the classroom + attendance inside the laboratory + electronic classes on the Google platform classroom) will be a supporting class for the attendance class and according to the controls and instructions of the Ministry of Higher Education and Research	
6. Number of Credit Hours (Total) / Number of Units (Total) 60 hours/2 units	
7. Course administrator's name (mention all, if more than one name) Sarah Abdel Hamid Hassan Ali Sarah.Abdulhameed235@tu.edu.iq	
....	
8. Course Objectives	
Course Objectives	1- Developing students' ability to follow and understand speech Developing their ability to distinguish between main ideas And high school. 2- Urging students to obtain knowledge Information and the ability to draw conclusions. 3- Developing their abilities to make quick summaries Comprehensive aspects of the topic. 4- Introducing students to bacterial groups, their importance and harm. 5-Bacterial diagnosis and classification. 6- Introducing students to the types of bacteria and distinguishing between them.
9. Teaching and Learning Strategies	

Strategy	It can be defined as a set of strategic rules. It can be defined as a set of general rules and broad lines that concern the means of achieving The desired goals of teaching refer to the methods and plans followed by faculty members to reach learning goals.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		An introductory introduction to microbiology	Standard method	Class performance and exams
2	2		Learn about laboratory equipment, how to use them, and what their purpose is Knowledge of laboratory safety precautions	Practical lesson in the laboratory	practical application
3	2		Sterilization	Standard method	Class performance and exams
4	2		Chemical sterilization	Standard method	Class performance and exams
5	2		Physical sterilization	Standard method	Class performance and exams
6	2		Bacterial growth in culture medium	Practical lesson in the laboratory	practical application
7	2		Diagnosis of bacteria on solid media	Practical lesson in the laboratory	practical application
8	2		Diagnosis of bacteria on liquid media	Practical lesson in the laboratory	practical application
9	2		Bacterial movement	Practical lesson in the laboratory	practical application
10			Application in school		
11			Application in school		

12			Application in school		
13			Application in school		
14			Application in school		
15			Application in school		
16			Application in school		
17			Application in school		
18	2		Bacteria shapes	Standard method	Class performance and exams
19	2		Bacterial staining	lesson in the laboratory	practical application
20	2		Antibiotic sensitivity testing	lesson in the laboratory	practical application
21	2		Quantification of sensitivity	lesson in the laboratory	practical application
22	2		Microbiological examination of water	Standard Method	Class performance and exams
23	2		Sources of water pollution	Standard method	Class performance and exams
24	2		Isolation and enumeration of water bacteria	lesson in the laboratory	practical application
25	2		Bacterial census	Standard method	Class performance and exams
26	2		Some important bacterial genera in soil	Standard method	Class performance and exams
27	2		Factors affecting the presence of bacteria in soil	Standard method	Class performance and exams

28	2		Viruses	Standard method	Class performance and exams
29	2		Methods for diagnosing viruses	Standard method	Class performance and exams

11. Course Evaluation

The grade distribution out of 15 is as follows: First semester exam of 6 and daily exam score

Second semester exam of 7 and grade on reports

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	laboratory manual and workbook in Microbiolog
Recommended books and references (scientific journals, reports…)	Microbiology Dr. Amin Salman Badawi Microbiology principles and Explorations
Electronic References, Websites	Prescott

CourseDescriptionForm

1. CourseName:**Microbiology**
2. CourseCode:
3. Semester/ Year:**2025 – 2026**
4. DescriptionPreparationDate:**11 / 11 / 2023**
5.AvailableAttendanceForms:**Presence**
6.NumberofCreditHours(Total)/NumberofUnits (Total): **4 hours**
7.Courseadministrator'sname(mentionall,ifmorethanonename)
Name: **Dr. Firas Adnan Hussain** Email: firas.adnan@tu.edu.iq
8. Course Objectives

Course Objectives	**1- Providing the student with information about the general features of microorganisms.** **2- Identifying microorganisms in terms of their phenotypic characteristics , internal and external structures, pathological aspects, and functional structural differences with eukaryotic microorganisms.** **3- Identify the stages of growth in microorganisms and the factors affecting growth.** **4- Discussing cellular metabolism and pathways for obtaining energy.** **5- Identify viruses and virus composition.**

9. Teaching and Learning Strategies

Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First w.	2 h.		Overview of microbiology and Beginning of Microscopy	Attendance in class	A written test
Second	2 h.		Evolution Of Prokaryotic Organisms	Attendance in class	A written test
Third	2 h.		verview of Eukaryotic andProkaryotic cells	Attendance in class	A written test
Fourth	2 h.		Taxonomy of microorganisms	Attendance in class	A written test
Fifth	2 h.		General characteristics of Prokaryotic and Eukaryotic organisms	Attendance in class	A written test
Sixth	2 h.		Structure of Bacterial Cell	Attendance in class	A written test
Seventh	2 h.		Cell Wall of Gram Negative bacteria	Attendance in class	A written test
eighth	2 h.		Controlling Bacteria by Damaging Cell Wall	Attendance in class	A written test
Ninth	2 h.		Cell Envelope Layers Outside the Cell Wall	Attendance in class	A written test
Tenth	2 h.		External Structures of Bacterial Cell	Attendance in class	A written test
eleventh	2 h.		Bacterial Cytoplasm	Attendance in class	A written test
twelveth	2 h.		Implementation		
Thirteenth	2 h.		Implementation		
Fourteenth	2 h.		Implementation		

Fifteenth	**2 h.**		**Implementation**		
Sixteen	**2 h.**		**Implementation**		
Seventeenth	**2 h.**		**Implementation**		
Eighteen	**2 h.**		**Bacterial Sporulation**	**Attendance in class**	**A written test**
Nineteenth	**2 h.**		**Growth of Microorganisms**	**Attendance in class**	**A written test**
Twenty	**2 h.**		**Factors Affecting Bacterial Growth**	**Attendance in class**	**A written test**
Twenty one	**2 h.**		**Nutritional (**Biochemical**) Factors**	**Attendance in class**	**A written test**
Twenty two	**2 h.**		**Essential Concepts of Metabolism**	**Attendance in class**	**A written test**
Twenty three	**2 h.**		**aerobic Metabolism- Glycolysis and Fermentation**	**Attendance in class**	**A written test**
Twenty four	**2 h.**		**VIRUSES**	**Attendance in class**	**A written test**

11. Course Evaluation
monthly written exams 32% , 2- Daily written exams 3% , 3- Practical exam15%.

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1- **Microbiology Principles and Explorations.**

2- **Prescott s Microbiology.**

3- **Jawetz, Melnick&Adelbergs Medical Microbiology**

==========

1- www.sciencedirect.com

2- www.britannica.com

3- www.microbiologysociety.org

Course Description Form

1. Course Name:Parasites	
2. Course Code:thr forth stage	
3. Semester / Year: annual 2025	
4. Description Preparation Date:2/ 11/ 2025	
5. Available Attendance Forms:class lectures+ electronic lectures	
6. Number of Credit Hours (Total) / Number of Units (Total) 90 hour	
7. Course administrator's name (mention all, if more than one name)	
Name:lntisar Ghanem Abd al-wahab Email: dr.en 79 @tu.edu.iq	
8. Course Objectives	
Course Objectives	•enabling students to identify medically Important species of parasites Learn about methods of diagnosis parasites and methods of preventing infection and injury Enabling students to understand the material and introduce it in a simple and understandable manner

9. Teaching and Learning Strategies	
Strategy	Providing psychological motivation to achieve scientific goals Providing scientific lectures modern up to date and from farious sources

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
October	8	Understanding the ideas of the topic and being able to apply it with questions	General instructions on studying parasites and using a microscope	Lecture on the blackboard + data show demonstration	Understanding the ideas of the topic and being able to apply it with examples
November	8	Understanding the ideas of the topic and being able to apply it with questions	Amoeba parasitic on humans	Lecture on the blackboard + data show demonstration	Understanding the ideas of the topic and being able to apply it with

					examples
December	8	Understanding the ideas of the topic and being able to apply it with questions	Zoospores and hemospores	Lecture on the blackboard + data show demonstration	Understanding the ideas of the topic and being able to apply it with examples
January	8	Understanding the ideas of the topic and being able to apply it with questions	Haemoflagellates + first semester exam	Lecture on the blackboard + data show demonstration	Understanding the ideas of the topic and being able to apply it with examples
February	4	Understanding the ideas of the topic and being able to apply it with	Toxoplasma and Ciliates		

		questions			
March	8	Understanding the ideas of the topic and being able to apply it with questions Understanding the ideas of the topic and being able to apply it with questions	Division of flatworms		
March	8	Understanding the ideas of the topic and being able to apply it with questions	Division of nematodes		

May	4	Understanding the ideas of the topic and being able to apply it with questions	Division of annelids		
May	4	Understanding the ideas of the topic and being able to apply it with questions	Phylum Tapeworms		
May	4	Understanding the ideas of the topic and being able to apply it with questions	Second semester exam		

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Plant physiolog	
2. Course Code:	
Plant physiology /fouth stage	
3. Semester / Year:	
Annual 2025	
4. Description Preparation Date:	
2/11/2024	
5. Available Attendance Forms:	
Class lectures+electronic lectures	
6. Number of Credit Hours (Total) / Number of Units (Total)	
90 hourse	
7. Course administrator's name (mention all, if more than one name)	
Name: Ayyub J.Abdlrahmaan Email:dr_ayyub_bio@tu.edu.iq	
8. Course Objectives	
Course Objectives	• . Enabling students to understand the mechanism by which a plant organ can perform its functions.... • Introducing female students to the most prominent physiological and botanical scientists and their innovations, inventions, and theories in the field of plant physiology.... • . The student understands the mechanism of transport of water, nutrients and hormones within the

	plant.... •

9. Teaching and Learning Strategies

Strategy	•- Providing psychological motivation to achieve scientific goals. •- Providing modern, eloquent scientific lectures affecting the scientific aspect, which encourages students to believe in the role of plant physiology in providing food security.

10. Course Structure

Week	Hours	Required Learn Outcomes	Unit or subject name	Learning method	Evaluation method
Oct.1	2		The concept of plant physiology	Lectures + demonstration	Class performance and exams
Oct.2	2		Solutions	Lectures + demonstration	Class performance and exams
Oct.3	2		Osmotic pressure	Lectures + demonstration	Class performance and exams
Oct.4	2		Water absorption	Lectures + demonstration	Class performance and exams
Nov.1	2		Transpiration concept	Lectures + demonstration	Class performance and exams
Nov.2	2		Minerai nutrition	Lectures + demonstration	Class performance and exams
Nov.3	2		Active Absoprption	Lectures + demonstration	Class performance and exams
Nov.4	2		Photosynthesid	Lectures + demonstration	Class performance and exams
Dec.1	2		Dark Reactions	Lectures + demonstration	Class performance and exams
Dec.2	2		Photosynthesis factors	Lectures + demonstration	Class performance and exams
Dec.3	2		Phloem Transpiration	Lectures + demonstration	Class performance

					and exams
Dec.4	2		Plant growth and formation	Lectures + demonstration	Class performance and exams
Jun.1	2		Plant regulations	Lectures + demonstration	Class performance and exams
Jun.2	2		Auxins	Lectures + demonstration	Class performance and exams
Jun.3	2		Gibbrilins	Lectures + demonstration	Class performance and exams
Jun.4	2		Cyotkinins	Lectures + demonstration	Class performance and exams
Feb.1	2		Ethylin	Lectures + demonstration	Class performance and exams
Feb.2	2		Light perioApplication in schools d	Lectures + demonstration	Class performance and exams
Marc.1	2		Application in schools		
Marc.2	2		Application in schools		
Marc.3	2		Application in schools		
Marc4	2		Application in schools		
Apr.1	2		Dormancy reasonse	Lectures + demonstration	Class performance and exams
Apr.2	2		Medicinal plants	Lectures + demonstration	Class performance and exams
Apr.3	2		General Review	Lectures + demonstration	Class performance and exams
Apr.4	2		Selection and positional movement	Lectures + demonstration	Class performance and exams
May.1	2		Seed germination and dormancy	Lectures + demonstration	Class performance and exams
May.2	2		Dormancy reasonse		
Mat 3,4			General Review		

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Plant Taxonomy
2. Course Code:
Plant Taxonomy / second stage
3. Semester / Year:
2025\2026
4. Description Preparation Date:
2025/11
5. Available Attendance Forms:
Class lectures + electronic lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
90 hours
7. Course administrator's name (mention all, if more than one name)

Shaymaa Ali Hassan Shaymaa.Ali@tu.edu.iq

8. Course Objectives	
Course Objectives	Enabling students to understand the mechanism by which a plant organ can perform its functions • Introducing students to the most prominent scientists in physiology and plants and their innovations, inventions and theories in the field of plant physiology. • The student understands the mechanism of transport of water, nutrients and hormones within the plant • •

9. Teaching and Learning Strategies	
Strategy	Providing Taxonomy cal motivation to achieve scientific goals- Providing modern, eloquent scientific lectures that influence the scientific aspect, which encourages students to believe in the role of plant Taxonomy in providing food security.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October 1	2		Concept of Plant Taxonomy	Standard method, text method	Class performance and exams
October 2	2		Herbaria and their stages	Standard method, text method	Class performance and exams
October 3	2		Drying	Standard method, text method	Class performance and exams
October 4	2		Plant parts	Standard method, text method	Class performance and exams
November 1	2		Root	Standard method, text method	Class performance and exams
November2	2		Root shapes	Standard method, text method	Class performance and exams
November 3	2		Stem	Standard method, text method	Class performance and exams
November4	2		Stem shapes	Standard method, text method	Class performance and exams
December1	2		Leaf	Standard method, text method	Class performance and exams
December 2	2		Leaf types	Standard method, text method	Class performance and exams
December3	2		Leaf shapes	Standard method, text method	Class performance and exams
December4	2		Leaf venation	Standard method, text method	Class performance and exams
January 1	2		Leaf arrangement (Phyllotaxy)	Standard method, text method	Class performance and exams
January 2	2		Flowers	Standard method, text method	Class performance and exams
January 3	2		Flower parts	Standard method, text method	Class performance and exams
January4	2		Flower types	Standard method, text method	Class

					performance and exams
February 1	2		Fruits	Standard method, text method	Class performance and exams
February 2	2		Fruit types	Standard method, text method	Class performance and exams
March 1	2		Origin of fruits	Standard method, text method	Class performance and exams
March 2	2		Seeds	Standard method, text method	Class performance and exams
March 3	2		Seed shapes	Standard method, text method	Class performance and exams
March 4	2		Seed types	Standard method, text method	Class performance and exams
April1	2		Reproductive organs in plants	Standard method, text method	Class performance and exams
April2	2		Male organs	Standard method, text method	Class performance and exams
April 3	2		Female organs	Standard method, text method	Class performance and exams
April 4	2		Plant types	Standard method, text method	Class performance and exams
Mays1	2		Medicinal plants	Standard method, text method	Class performance and exams
mais2			General Review		
May 3 and 4			final exams		

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Biology
2. Course Code:Bio117
Biology / Third
3. Semester / Year:
2025-2026
4. Description Preparation Date:
2/11/2025
5. Available Attendance Forms:
Class Lecture + electronic lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
70 hourse
7. Course administrator's name (mention all, if more than one name)
Name: Israa Abdel Monei m ..... Moha med ..... الايميل israa. moha mmed @tu.e du.iq Email:
8. Course Objectives

Course Objectives	• • •

9. Teaching and Learning Strategies

Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

*Please check the boxes corresponding to the individual learning outcomes from the program subject to evaluation

Course description form

1. Course name
Teaching methods for the third stage
2. Course code
COE4
3. Semester/year
2026 / 2025
4. The date this description was prepared
5. Available forms of attendance
Attend my class + electronic class ongoogle classroomIt will be a supporting class for the attendance class according to the controls and instructions of the Ministry of Higher Education and Scientific Research
6. Number of study hours (total) / number of units (total)
2 hours per week = 60 hours / units 2 units
7. Name of the course administrator (if more than one name is mentioned)
Name:Dr.Sara Mohsin mawlood Email:sara.mehsn@tu.edu.iq

8. Course objectives	
The curriculum aims to prepare students to practice the teaching profession by learning about: .1Knowing and understanding the meaning of teaching methods and related standards .2Theoretical skills that enable the student to analyze and understand teaching methods .3Thinking and analysis skills enable them to know teaching methods .3Self-development skills that enable female students to compete with others .4Learn teaching methods and methods .5Learn practical applications of teaching methods	Objectives of the study subject
9. Teaching and learning strategies	
-Lecture method **_Method of discussion and interrogation** **Method of solving problems**.	The strategy

10. Course structure: The study began on 20/9/2025 and ends on 19/5/2026, the date of the start of final exams.

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Class performance and exams	Lecture method and raising questions	Introduction to teaching methods		**2**	**September -3**

Class performance and exams	Lecture method and raising questions	Educational goals		**2**	**September -4**
Class performance and exams	Lecture method and raising questions	Areas of educational objectives		**2**	October 1
Class performance and exams	Lecture method and raising questions	Behavioral goals		**2**	October 2
Class performance and exams	Lecture method and raising questions	Formulating behavioral goals		**2**	October 3
Class performance and exams	Lecture method and raising questions	Planning		**2**	October 4
Class performance and exams	Lecture method and raising questions	Planning principles		**2**	November 1
Class performance and exams	Lecture method and raising questions	Types of plans		**2**	November 2
Class performance and exams	Lecture method and raising questions	Daily plan		**2**	November 3
Class performance	Lecture method and	elocution		**2**	November 4

and exams	raising questions				
Class performance and exams	Lecture method and raising questions	Interrogation method		**2**	December 1
Class performance and exams	Lecture method and raising questions	Discussion method		**2**	December 2
Class performance and exams	Lecture method and raising questions	Method of solving problems		**2**	December3
Class performance and exams	Lecture method and raising questions	Exploration method		**2**	December 4
				2	January 1
				2	January 2
Class performance and exams	Lecture method and raising questions	Programmed teaching method		**2**	February 1
Class performance	Lecture method and raising questions	Concept maps		**2**	February 3
Class performance and exams	Lecture method and raising questions	Extrapolation method		**2**	February 4
Class	Lecture	Conclusion		**2**	March 1

performance and exams	method and raising questions	method			
Class performance and exams	Lecture method and raising questions	Teaching skills		**2**	March 2
Class performance and exams	Lecture method and raising questions	The skill of starting and finishing the lesson		**2**	March 3
Class performance and exams	Lecture method and raising questions	Boost skill		**2**	April 1
Class performance and exams	Lecture method and raising questions	The skill of arousing motivation		**2**	April2
Factors affecting the administrative process	Class performance and exams	Class control skill		**2**	April 3
Factors affecting the administrative process	Class performance and exams	The skill of asking questions		**2**	April 4
Factors affecting the administrative process	Class performance and exams	Teaching aids		**2**	May 1

11. Course evaluation
Distribution of the grade out of 100 according to the tasks assigned to the

student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

The degree is distributed through several channels:

1- Formative (formative) assessment through daily exams, observing and following up on the student's performance in class discussions and homework assignments, and classroom evaluation. Her grade does not exceed 20% of the total.

2- Diagnostic evaluation of the semester and final exams to issue judgments of success and failure. This grade is 80% and is divided into (4) exams for each semester, two exams, to extract the annual endeavor before entering the final exams.

12. Learning and teaching resources

General teaching methods book	Required textbooks (methodology, if any)
.1Introduction to teaching methods, Abdel Wahab Awad .2Modern trends in curricula and teaching methods, Kawthar Hassan .3Effective teaching skills, Nayfa Qatami .4Basic principles in general teaching methods	Main references (sources)
Access to everything recent and published in peer-reviewed scientific journals	Recommended supporting books and references (scientific journals, reports...)
	Electronic references, Internet sites

Course description template

Course Name .١
Practical animal physiology
Course Code .٢
Bio114a
Term/Year .٣
2025−2026
Date this description was prepared .٤
15-11-2025
Available attendance formats .٥
My work in the laboratory
Number of study hours / Number of units .٦
60/hours 2units
Name of the course coordinator (if there is more than one, please mention it) .٧
Dr Fahad saber awain EMAIL fahad.saber903@tu.edu.iq
8 Course Objectives .

1. Cognitive objectives

- **Reinforcing theoretical concepts:** Linking the theoretical information that the student studied to practical reality through direct observation of vital activities.
- **Understanding physiological indicators:** Introducing students to the normal ranges of vital functions and distinguishing between normal and abnormal conditions.
- **Familiarity with modern technologies:** Introducing students to the latest devices and technologies used in measuring and diagnosing physiological functions.

2. Skill-based objectives

- **Mastering laboratory work:** Enabling female students to conduct physiological experiments (such as drawing blood, measuring blood pressure, and examining tissues) with high efficiency.
- **Developing analytical skills:** Developing the student's ability to analyze data extracted from experiments and interpret the results in a logical, scientific manner.
- **Handling laboratory animals:** Training female

3. Behavioral and value-based objectives

- **Promoting the ethics of scientific research:** Instilling a spirit of scientific integrity in monitoring results, and respecting ethical rules of animal welfare during experiments.
- **Working as a team:** Developing communication and cooperation skills among female students to accomplish group experiments efficiently.
- **Applying safety standards:** Strict adherence to laboratory safety rules to ensure a safe working environment for the student and teaching staff.

4. Developmental objectives

- **Problem solving:** Stimulating critical thinking among female students by deducing the causes of functional disorders based on laboratory results.
- **Self-learning:** Encouraging female students to research scientific sources to explain the physiological phenomena observed in the . laboratory

students on the correct and safe methods of handling laboratory animals and preparing them for study.	

9 Teaching and learning strategies .

First: Knowledge Transfer Strategies

- **Blended learning:** Combining the standard (lecture) method with e-learning to ensure that information is delivered in a flexible and continuous manner.
- **Multimedia and smart technologies:** Employing modern presentation tools (Data Show) ,smart board , educational videos and illustrations to simplify complex physiological concepts.
- **Inductive and deductive learning:** Encouraging students to move from specific ,examples to general rules which promotes a deeper understanding of the material.

Second: Active learning strategies

- **Problem solving:** Placing female students in situations that require critical thinking to find solutions to scientific problems or case studies.
- **Interactive dialogue and discussion:** Activating classroom interaction and exchanging opinions between students and teaching staff to discuss learning difficulties and suggest appropriate solutions.

Third: Self-learning and research strategies

- **Academic assignments and homework:** Enhancing scientific responsibility by assigning students periodic homework assignments on curriculum topics.
- **Desktop and electronic research:** Directing female students to use the paper library and reliable scientific websites to broaden their academic horizons and keep up with developments in the science of physiology.

Fourth: Applied Strategies

- **Laboratory learning:** Applying theoretical concepts practically within the educational laboratory to consolidate performance and technical skills.

10 Course Structure .

Week	Hours	Required learning outcomes	Unit or topic name	Learning method	Evaluation Method
For a week	Hours	Unit/Subject Name	Required learning outcomes	Learning method	Evaluation Method
1	2-3	:Neurophysiology Reflex Actions The Common) (Frog	Understanding the mechanism of the reflex arc in the normal state and	Practical / experience demonstration	Direct observation report /

			monitoring the .reactions		
2	2-3	:Neurophysiology Reflex Actions The) Anencephalic (Frog	Distinguishing between reactions in the presence and absence of the brain inhibition of higher) .(centers	Dissection and practical experiment	Laboratory report
3	2-3	Nerve :Physiology Reflex Actions (Spinal Frog)	Studying only spinal reflexes and the effects of spinal cord damage (spinal .(trauma	Dissection and practical experiment	Short exam (quiz)
4	2-3	Skeletal muscle :physiology Muscletwitch	Identifying the stages of simple muscle ,contraction (latency ,contraction .(relaxation	Using a chemograph simulator/	Graph analysis
5	2-3	Skeletal muscle :physiology spatial and temporal summation	Understanding how to increase the force of contraction by increasing the intensity or frequency .of the stimulus	practical experience	Laboratory report
6	2-3	Skeletal muscle :physiology Tetanus	Studying the effect of continuous stimulation and reaching a state of sustained .contraction	practical experience	Discussion of results
7	2-3	Skeletal muscle :physiology Musclefatigue	Identifying the point of muscle fatigue and its .physiological causes	practical experience	Laboratory report
8	2-3	Frog heart physiology: A study of normal heart rate	Calculating heart rate and identifying the cardiac cycle in .amphibians	Dissection and observation	direct observation
9	2-3	Frog heart physiology: the effect of temperature and drugs on the pulse	Conclusion on the effect of cold/heat and medications (such as adrenaline/acetylcholin .e) on the heart	practical experience	Report and comparison of results
10	2-3	Frog heart physiology: The ability of heart parts to perform autorhythmic movements .	Proof that the heart muscle is self-contracting and separates the venous .sinuses	A precise practical experiment	practical exam
11	2-3	Frog heart :physiology Determining the location of the pacemaker (pacemaker)	Identifying the Pacemaker in the frog's heart using Stanius . cords	practical experience	Laboratory report
12	2-3	Blood :physiology Determining the	Mastering methods for measuring hemoglobin (such as	Individual practical application	Accuracy of the result

		amount of hemoglobin	the Sahli method) and .diagnosing anemia		
13	2-3	Blood :physiology Hematocrit(PCV) determination	Measuring the size of packed cells and its relationship to hemoglobin and .viscosity	Practical application (Centrifuge)	Laboratory report
14	2-3	Blood :physiology Determining blood types (Blood Groups)	Detection of antigens and determination of blood type and Rh factor.	Quick practical application	Short test
15	2-3	Blood physiology: Red blood cell count (RBC count)	Using a counting slide (Neubauer) and calculating the number of red blood cells and .dilution equations	practical microscopic application	Chip and account check
16	2-3	Blood :physiology Calculating the total number of white blood cells (Total WBC)	Distinguishing between counting solutions and using a counting slide for .white blood cells	practical microscopic application	Accuracy of counting and calculation
17	2-3	:Hematology Differential (Discriminatory) Count of White - Blood Cells Part ١	Learn how to make a blood smearand stain it with Leishman/Gemsa .stain	practical application	Evaluating the quality of the swab
18	2-3	:Hematology Differential (Discriminatory) Count of White - Blood Cells Part ٢	Microscopic differentiation between the five cell types and calculation of .percentages	Microscopic examination	Report with drawings and proportions
19	2-3	Blood :physiology Study of red blood cellindices	CalculatingMCV, MCH, MCHC to mathematically diagnose types of .anemia	+ Lecture Math Problems	Problem solving/report
20	2-3	Digestive physiology: The effect of salivary amylase enzyme	Collecting saliva and testing its effect on starch (carbohydrate .(digestion	Test tube experiment	Note the color change (iodine)
21	2-3	Physiology of :digestion Factors affecting enzyme activity(temperature/pH)	Understanding the optimal conditions for the action of salivary enzymes and the effect of enzyme .boiling	practical experience	Laboratory report
22	2-3	Physiology of digestion: Pepsin enzyme digestion in the) (stomach	A study of protein digestion in an acidic medium and the effect ofHCl acid.	practical experience	Laboratory report
23	2-3	Physiology of :Digestion	Comparing starch digestion in the	practical experience	oral discussion

		Pancreatic Amylase	intestines with .digestion in the mouth		
24	2-3	Digestive :physiology Trypsin enzyme	A study of the completion of protein digestion in the alkaline environment .of the intestines	practical experience	Laboratory report
25	2-3	Digestive :physiology Sucrase enzyme and the effect of some intestinal enzymes	Detection of sucrose digestion products .(monosaccharides)	Biochemical experiment	Laboratory report
26	2-3	/ General review final exam	A comprehensive assessment of the practical skills acquired throughout .the course	Comprehensiv e practical exam	Final grade

11Course Evaluation .

- Formative assessment: This includes daily short tests(quizzes) active classroom , discussion, homework, and attendance commitment.
- Excellence and Enrichment: Additional marks are allocated for participation in solving competitive questions and advanced problems.
- Summative (Achievement) Assessment: This includes semester and final exams, which determine whether a student passes or fails. *(Note: The term was changed from diagnostic to summative/achievement because the diagnostic assessment usually takes place before the start of the lesson).*
- Practical assessment: Conducting practical tests (qualitative and quantitative) to assess the skills acquired within the laboratories.
- Scientific research: Students are assigned to prepare research and scientific papers to enhance their abilities in critical thinking, deduction, and problem-solving.
- Field activity: Organizing scientific visits to the central research laboratory.
- Behavioral and skills assessment: Direct observation of students' performance, focusing on dialogue skills, scientific communication, and teamwork within the university environment
- Grade distribution: The final grade (١٠٠٪) is distributed in a balanced manner that ,includes: attendance, practical performance, scientific reports, and tests (daily, monthly (and final.

12 Learning and teaching resources .

Textbooks	Required textbooks (methodology, if applicable)
Practical Physiology Book , Book of the Science of Organ Functions	Main references (sources)
Colored Atlas of Anatomy and Physiology: (To support the practical .(aspect and eye observation	Recommended supporting books and references (...scientific journals, reports)
PubMed / Google Scholar For : the latest research and studies .related to animal physiology ScienceDirect A database of : .scientific articles and books Virtual Labs (laboratory simulation sites)	Electronic references, websites

Course description template

1. Course Name
Biology is theoretical
2. Course Code
Bio102
3. Semester/Year
2025-2026
4. Date this description was prepared
2-11-2025
5. Available attendance formats
Classroom lectures + online lectures
6. Total number of study hours / Total number of units
70 hours
7. Name of the course coordinator (if there is more than one, please state it).
MD Fahd Saber Awain Email: iq.edu.tu@903saber.fahad
8. Course Objectives

Course objectives	• Introducing students to the most important biologists of previous eras. • Introducing students to methods of reproduction in plants and animals. • The students understand the difference between plant and animal cells.
9. Teaching and Learning Strategies	
strategy	**To provide female students with knowledge of scientific objectives and how Achieving it**

To give the students everything that is modern in the aspect of biology that benefits them and to introduce them to what is in modern biology.	

10. Course Structure

Week	Hours required		Unit or topic name	Learning method	Evaluation Method
	learning outcomes				
1	2		Biologists	The standard method, the text method,	Classroom performance and exams
2	2		The development of biology	the standard method. Text method	Classroom performance and exams
3	2		Defining the characteristics of life using the standard method.		Classroom performance and exams
4	2		Classification systems	The standard method, Text method	Classroom performance and exams
5	2		Reproduction and growth in animals	The standard method, Text method	Classroom performance and exams
6	2		The difference between plant and animal cells;	The standard method, Text method	Classroom performance and exams
7	2		plant characteristics	The standard method, Text method	Classroom performance and exams
8	2		food chain	The standard method, Text method	Classroom performance and exams
9	2		Plant arrangement	The standard method, Text method	Classroom performance and exams
10	2		Plant reproduction	The standard method, Text method	Classroom performance and exams
11			Final exams		

11. Course Evaluation

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

12. Learning and Teaching Resources

Nizar Mustafa Al-Malih	Required textbooks (methodology, if any), main
Hussein Ali Al-Saadi,	references (sources),
Biology, Author: Peter H. Raven and others	recommended supporting books and references (scientific journals).

	Reports...
Any site related to biology	Electronic references, websites

Course Description Form

1. Course Name:
inverebrate
2. Course Code: Bio107
Biology / seconed stage
3. Semester / Year:
2025
4. Description Preparation Date:
18/9/2024
5. Available Attendance Forms:
Class Lecture + electronic lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
70 hourse
7. Course administrator's name (mention all, if more than one name)
Name: Ashraf Jamal Mahm oud Email: dr.ash ..... raf_bi ..... o@tu. ..... edu.iq
8. Course Objectives

Course Objectives	1- Linking the scientific material to the external environment 2- Exploring the invertebrates present in the environment 3- Knowing the importance of these organisms in terms of benefits and harms to humans and their economic animals 4- Knowing the pathogens transmitted by invertebrates as biological or mechanical vectors 5- Knowing the methods of diagnosing and classifying invertebrates
9. Teaching and Learning Strategies	
Strategy	Using lecture, questioning and discussion method

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1-2	2	Introduction, Principles of Classification, Importance of Invertebrates, Biofouling, Parasitism		lecture, interrogation	assroom performance and exams
3-4-5	2	Phylum Protista		lecture, interrogation	Classroom performance and exams
6	2	Phylum Sponges		lecture, interrogation	Classroom performance and exams
7-8	2	Phylum Cnidaria		lecture, interrogation	Classroom performance and exams
9-10-11-12-13-14	2	Phylum Platyhelminthes		lecture, interrogation	Classroom performance and exams
15-16	2	Phylum Aschehelminthes		lecture, interrogation	Classroom performance and exams
17-18	2	Phylum Annelids		lecture, interrogation	Classroom performance and exams
19-20	2	Phylum Arthropoda		lecture, interrogation	Classroom performance and exams
21	2	Phylum Bryophyta		lecture, interrogation	Classroom performance and exams
22	2	Phylum mollusic		lecture, interrogation	Classroom performance and exams
	2	Final exams			Classroom performance and exams

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Recommended books and references	Of vertebrate paleontology
Electronic References, Websites	www.jstor.org www.reserchgate.net

Course Description Form

1. Course Name:
Computer
2. Course Code:
Unit or subject Semester / Year:
٢٠٢٥/٢٠٢٦
name Description Preparation Date:
21/9/2025
5. Available Attendance Forms:
Classroom and Google classroom
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours
7. Course administrator's name (mention all, if more than one name)
Name Fatin Haitham Moulood Emil : Fatin.Haitham@tu.edu.iq
8. Course Objectives

Course Objectives	• The student gets to know the concept of computer science • The student should be familiar with the personal computer • For the student to recognize the difference and relationship between software and the physical parts inside the computer • For the student to recognize the importance of using a computer • The student gets to know how the internal computer parts work • The student gets to know the concept of information that the computer deals with and its classification • The student will know how information enters

	and exits to and from the computer • The student gets to know some operating systems • The student gets to know the relationship between operating systems and hardware • That the student be able to maintain some parts of the computer • For the student to learn about the benefits of the computer in his general life • The student will know how used the Microsoft Word •The student will know how used the Microsoft PowerPoint •The student will know how used the printer to Print documents •The student will know how used the Internet, networking, and email creation • That the student be able to know the internal parts of the computer in a concrete way • Introducing the student to concepts and strategies for computer operation
Learning	
12.	To apply what he has learned for the purpose of solving many issues and problems in the same subject -Distinguishes how information enters and exits from and to the computer -Distinguishes between different types of operating systems. -Recognizes the internal parts of the computer in a tangible way

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

4	8 hours	Chapter One(p1)	Computer fundamentals	lectures, Computer, board and pen.	Report, Exams and discussions.
6	12 hours	Chapter two(p1)	Computer's components	lectures, Computer, board and pen.	Report, Exams and discussions
4	8 hours	Chapter four(p1)	operating systems	lectures, Computer, board and pen.	Report, Exams and discussions
4	8 hours	Chapter One(p2)	the Microsoft Word	lectures, Computer, board and pen.	Report, Exams and discussions
4	8 hours	Chapter three(p2)	the Microsoft PowerPoint	lectures, Computer, board ,computer and pen.	Report, Exams and discussions
4	8 hours		Print documents	lectures, Computer, board ,computer , printer and pen	Report, Exams and discussions
4	8 hours		the Internet, networking, and email creation	lectures, Computer, board ,net and pen.	Report, Exams and discussions

11. Course Evaluation

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

12. Learning and Teaching Resources

12- curricular books, if any)	
Required textbooks (	
Recommended books and Learning and Teaching Resources (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Medical Enyomlolgy
2. Course Code:
Bio 123 a
3. Semester / Year:
2025
4. Description Preparation Date:
2/11/2025
5. Available Attendance Forms:
Class Lecture + electronic lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hourse
7. Course administrator's name (mention all, if more than one name)
Alaa Emad alaa.altikrity @tu.rdu.iq
8. Course Objectives

Course Objectives	• • ..... •

9. Teaching and Learning Strategies	
Strategy	Standara method (automatic) Text method Inductive (deductive) method How to solve problem

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4 Hours	Understanding the topic of the lecture	Understanding the history of medical entomology	Standard method, text method	Classroom performance and exams

2		Understanding the topic of the lecture	Insect mouthparts	Standard method, text method	Classroom performance and exams
3		Understanding the topic of the lecture	Life cycle of some insect-borne parasites	=	=
4		Understanding the topic of the lecture	Classification of some types of medical insects	=	=
5		Understanding the topic of the lecture	Transmission of infection through certain insects	=	=
6		Understanding the topic of the lecture	The difference between some medical insects	=	=
7		Understanding the topic of the lecture	The most important types of insects from a medical perspective	=	=
8		Understanding the topic of the lecture	sand flies	=	=
9		Understanding the topic of the lecture	How to differentiate between mosquito species	=	=
10		Understanding the topic of the lecture	Mites and ticks (medical and veterinary)	=	=
11			Final exams		

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Human Rights Course Description

1. Course Name
Rights and Democracy
2. Course Code
First Stage, Department of Life Sciences
Semester/Year
٢٠٢٥\٢٠٢٦
Date of Preparation of this Description
٢٠٢٥/١٠/١٥/
E. Available Attendance Formats
In-person instruction with the creation of an online classroom via the Google Classroom platform. This online classroom will serve as a supplement to the in-person class, and the online classroom code will be in accordance with the regulations and instructions of the Ministry of Higher Education and Scientific Research.
6. Total Credit Hours / Total Units
28 hours / 2 units
Name of Course Coordinator
Name: M.M. Abdul Munaf Mohammed Jassim Email: AbdAlmunaf Mohmmed@tu education iq
Course Objectives

❖ The importance of the Human Rights and Democracy course lies in the student's study of the most important rights stipulated in international norms and laws, as well as those stipulated in Islamic Sharia and Iraqi constitutions, particularly the current constitution of 2005. Furthermore, the student will learn about international conventions issued regarding human rights. On the other hand, the student will also be exposed to the democratic experiences that preceded us in order to learn from them.	General Course Objectives

To increase students' understanding of educational and social realities throughout the ages and to grasp educational journey in its utmost necessities and understand educational theories across the of peoples, ancient and modern.	Course Objectives
Teaching and Learning Strategies	
Student textbook, and the most important available tools: the blackboard, colored markers, dialogue and discussion, and some classroom activities Using educational discussion (educational dialogue), which relies on the exchange of ideas to arrive at facts. Using modern scientific technologies (overhead projector). Group notebook to involve all students in classroom activity.	
10. Course Structure	

Assessment Method	Teaching Method	Name of Unit/Course or Topic	Required Learning Outcomes	Hours	Week
Formative Assessment	Lecture Method	- The meaning of rights linguistically and technically. The stages that the idea of rights and freedoms has gone through		2	First
Formative Assessment	Lecture Method	Types of Human Rights in International Law: Civil and Political Rights (Right to Life - • Right to Security - Freedom of Belief - Freedom of Movement and Travel - Freedom of Opinion - Right to Equality)		2	Second
Formative Assessment	Method Lecture	Economic, Social, and Cultural Rights (Right to Work - Right to Education - Right to Property - Right to Social Welfare - Right to a Clean Environment)		2	III
Formative Assessment	Lecture Method	Rights of Vulnerable Groups and Categories - Women's Rights - Children's Rights - Minority Rights.		2	IV
Formative Assessment	Lecture Method	Human Rights in Ancient Civilizations and Nations		2	V
Formative Assessment	Lecture Method	Human Rights in the Abrahamic Religions		2	VI

Formative evaluation	Lecture method	Islamic perspectives on the Universal Declaration of Human Rights		2	Seventh
Formative evaluation	Lecture method	Introduction to human rights in Islam		2	Eighth
Daily quizzes, practical exercises, · monthly exams	Lecture method	Parental rights		2	Ninth
Formative evaluation	Lecture method	Similarities and differences in women's rights between Sharia and international law		2	tenth
Formative evaluation	Lecture method	Human rights in international – conventions - the Charter of the United Nations. The Universal Declaration of Human Rights.		2	The eleven
Formative assessment is monthly	Lecture method	The bourgeois interpretation of the bourgeois materials of the Universal Declaration of Human Rights.		2	twelfth
A formative assessment	Lecture method	Arab Charter on Human Rights - Islamic Charter on Human Rights		٢	thirteenth
Formative evaluation	Lecture method	Human rights guarantees and legal guarantees b) Judicial guarantees c) Political and-social guarantees		٢	fourteenth
Formative evaluation	Lecture method	Definition of democracy - the principle of Shura		٢	fifteenth
Formative evaluation	Lecture method	The roots of the concept of democracy and its development		٢	sixteenth
Formative evaluation	Lecture method	Forms of Democracy: Direct Democracy (Content of Direct Democracy - Applications) — Direct democracy (an assessment of the direct democracy system)		٢	seventeenth
Formative evaluation	Lecture method	Semi-direct democracy: The content and manifestations of semi-direct democracy Semi-direct democracy - the participation of the people in legislative work, popular objection - - popular proposal.		٢	eighteenth

Formative Assessment	Lecture Method	Universal Suffrage - Restricted Suffrage - Electoral Districts		٢	Thirty

11. Course Assessment
Distribution of the 100 mark according to the tasks assigned to the student, such as daily preparation and exams Daily, oral, monthly, written, reports, etc. Written Exam Homework and Classroom Activities - Assignments and applications at the end of each stage. - Discussions with students. First semester exam: 15 marks (5 marks for student report and participation) (5 marks for daily attendance) Second semester exam: 15 marks (5 marks for class participation and interaction) (5 marks for daily attendance) Final exam: 50 marks, and the final total equals 100 marks.

12. Learning and Teaching Resources	
The book "Human Rights, the Child, and Democracy" by Professor Dr. Maher Saleh Alawi and others	Required Textbooks (Methodology, if any)

College Library for Additional Resources ☐ ✓ For course materials, consult scholarly websites: Islamic Theories in the Declaration of Human Rights, by Sayyid Muhammad ✓ Muhammad Sadiq al-Sadr	Main References (Sources)
All reputable scholarly journals related to the broad . concept of rights and freedoms Human Rights in Islam, International Conventions, and Constitutions Arabic, by Professor Dr. Nawaf Kanaan	Recommended Supporting Books and References (Scholarly Journals, Reports, etc.)
The Iraqi Constitution of 2005, Lectures on Public Freedoms by Dr. Saleh Jawad al-Kadhim	Electronic References, Websites

1. Course Name
Algae and Archegonhate / practical
2. Course Code /Bio 118a
Algae and Archegonhate / Stage III
3. Semester/Year
Yearly /2025
4. Date of preparation of this description
2/11/2025
5. Available Attendance Forms
Classroom + Lab + Classroom electronic on the Google platform classroom) It will be a supportive class for the attendance class and according to the controls and instructions of the Ministry Higher Education and Scientific Research
6. Number of credit hours (total) / number of units (total)
60/two units
7. Course administrator's name (if more than one name is mentioned)
Name: Eng. Saba Abdal Karim Mustafa Email:Saba.a.mustafa@tu.edu.iq
8. Course Objectives

Course Objectives	● Knowledge and understanding of algaeology, and everything related to it. ● Forming experience among students on tests and analysis in the field of algae science and its types and how to distinguish between algae people, in addition to developing students' concepts in diagnostic characteristics and classification of algae. ● Introducing students to the importance of algae and their relationship to the environmental and Biological field and the most important branches that have a relationship with this science.

9. Teaching and learning strategies	
Can be defined as a set of general rules	Standard method (lecturing) The route of discussion and interrogation**.**

and the outline that is concerned with the means of achieving The desired objectives of teaching refer to the methods And the plans followed by faculty members to reach the goals o fLearning also aims to provide psychological motivation to achieve scientific goals and provide modern scientific lectures that keep pace with development and from different sources	Problem solving method . Brainstorming method .

10. Course Structure

The week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October 1	2	Understand the ideas of the topic and be able to apply it with examples	General laboratory guidelines with introduction to algae	Lecture on the board + demo	General questions and discussion
October 2	2	Understand the ideas of the topic and master its applications	Recent trends adopted in the classification of ecological algae, presence and diffusion	Whiteboard Lecture + Demonstration	General questions and discussion
October 3	2	Understand the ideas of the topic and be able to apply it with examples	- Division of blue-green algae, environment and spread, classification, features	Lecture on the board + demo	General questions and discussion
October 4	2	Understand the ideas of the topic and be able to apply it with examples	Examples of some genera of blue-green algae	Lecture on the board + slides show	General questions and discussion
November 1	2	Understand the ideas of the topic	General introduction to green algae, their	Whiteboard Lecture +	General questions and discussion

		and master its applications	ecological qualities and presence	Demonstration	
November 2	2	Understand the ideas of the topic and be able to apply it with examples	Supplementing green algae by giving examples of some ranks and genera	Lecture on the board + slides show	General questions and discussion
November 3	2	Understand the ideas of the topic and be able to apply it with examples	The phylum of curry algae, its environment, its classification - some examples	Lecture on the board + slides show	General questions and discussion
November 4	2	Understand the ideas of the topic and master its applications	Euglin algae phylum / its features, structure, classification and examples of some genera	Lecture on the board + slides show	General questions and discussion
December 1	2	Understand the ideas of the topic and master its applications	The Golden Algae Division, its features - its classification - environment and presence	Whiteboard Lecture + Demonstration	General questions and discussion
December 2	2	Understand the ideas of the topic and master its applications	Division of golden algae study of some of its varietiesDiatoms, chrysophyceae, xanthophyceae	Lecture on the blackboard + presentation of the genera slides	General questions and discussion
December 3	2	Understand the ideas of the topic and master its applications	Phylum Algae Crete	Lecture on the board + slides show	General questions and discussion
December 4	2	Understand the ideas of the topic and master its applications	Prostate algae phylum	Lecture on the board + slides show	General questions and discussion

January 1	2	Understand the ideas of the topic and master its applications	- Division of Crete Algae	Lecture on the board + slides show	General questions and discussion
January 2	2	Understand the ideas of the topic and master its applications	- Division of brown algae, its features, Composition of the environment and presence, some examples	Lecture on the board + slides show	General questions and discussion
January 3	2	Understand the ideas of the topic and master its applications	- The division of red algae, its features, its structure, its classification Some examples	Lecture on the board + slides show	General questions and discussion
January 4	2	Understand the ideas of the topic and master its applications	- Environmental and economic importance of red algae	Whiteboard Lecture + Demonstration	General questions and discussion
February 1	2	Understand the ideas of the topic and master its applications	Knowledge of recent trends in the purification of the study of algae	Whiteboard Lecture + Demonstration	General questions and discussion
February 2	2	Understand the ideas of the topic and master its applications	- Extraction of some toxic substances from some algae	Whiteboard Lecture + Demonstration	General questions and discussion
March 1	2	Understand the ideas of the topic and master its applications	- Mosses and their importance, classification and comparison with algae	Whiteboard Lecture + Demonstration	General questions and discussion
March 2	2	Understand the ideas of the topic	- Liver moss and their classification with some examples	Lecture on the board + special	General questions and discussion

		and master its applications		slides show	
March 3	2	Understand the ideas of the topic and master its applications	Classification and classification of the mosses with the genus Anthroceros as an example	Lecture on the board + special slides show	General questions and discussion
March 4	2	Understand the ideas of the topic and master its applications	Existing mosses - their characteristics with some examples	Lecture on the board + special slides show	General questions and discussion
April 1	2	Understand the ideas of the topic and master its applications	Physiology of water absorption in sphagnum plant and methods of reproduction	Whiteboard Lecture + Demonstration	General questions and discussion
April 2	2	Understand the ideas of the topic and master its applications	Ferns, traits, spread, difference and similarity with mosses	Whiteboard Lecture + Demonstration	General questions and discussion
April 3	2	Understand the ideas of the topic and master its applications	Some examples of ferns	Lecture on the board + slides show	General questions and discussion
April 4	2	Understand the ideas of the topic and master its applications	Similarity between ferns and gymnosperms	Whiteboard Lecture + Demonstration	General questions and discussion
May 1	2	Understand the ideas of the topic and master its applications	Classification of ferns class psilophyceae	Lecture on the board + slides show	General questions and discussion
May 2	2	Understand the ideas of the topic	Class lycopodineae plants	Whiteboard Lecture +	General questions and discussion

		and master its applications		Demonstration	
May 3	2	Understand the ideas of the topic and master its applications	Horse tails class, Khanshariat class	Whiteboard Lecture + Demonstration	General questions and discussion
May 4	2	Understand the ideas of the topic and master its applications	Gymnosperms Plants Classified and Compared with Ferns with Some Examples	Whiteboard Lecture + Demonstration	General questions and discussion

11. Course Evaluation	
Distribution of the score out of 15 according to the following: The first semester exam out of 6 and the score of a daily exam Second semester exam out of 7 and score on reports	
12. Learning and Teaching Resources	
Required textbooks (methodology, if any)	Bahram Khader Mawlid,Practical algae and arcicons 1990
Key references (sources)	Al-Saadi, Algaeology 2006
Recommended books and references (scientific journals, reports...)	Scientific research from Google Scular
Electronic References, Websites	

Course Description Form

1. Course Name:
Biology
2. Course Code:
Biology / First stage
3. Semester / Year:
2025-2026 annual
4. Description Preparation Date:
2 /11/2025
5. Available Attendance Forms:
Class lectures, electronic lectures, and practical laboratories
6. Number of Credit Hours (Total) / Number of Units (Total)
60 Hours /2 Unit
7. Course administrator's name (mention all, if more than one name)
Name: Sheelan Qadir Sadiq Email: shmscbio@tu.edu.iq
8. Course Objectives

Course Objectives	* **Introducing the students to the construction of a microscope and its use in laboratories** * **Introducing the students to some laboratory tools and equipment** * **Introducing the students to some examples of the branches of the animal kingdom**
9. Teaching and Learning Strategies	
Strategy	• **Providing scientific knowledge for students and how to achieve it** • **Giving students the modern aspect of biology and learning about what is present in the animal kingdoms**
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Microscope	Standard method Text method	Descriptive performance and examinations
2	2		Plant and animal cells	Standard method Text method	Descriptive performance and examinations
3	2		Cell division	Standard method Text method	Descriptive performance and examinations
4	2		Plant tisses	Standard method Text method	Descriptive performance and examinations
5	2		Animal tissues	Standard method Text method	Descriptive performance and examinations
6	2		Blood and its components	Standard method Text method	Descriptive performance and examinations
7	2		Classification of organisms	Standard method Text method	Descriptive performance and examinations
8	2		Kingdom Fungi	Standard method Text method	Descriptive performance and examinations

9	**2**		**Phylum Annelida**	**Standard method Text method**	**Descriptive performance and examinations**
10	**2**		**Dissection of Frog**	**Standard method Text method**	**Descriptive performance and examinations**

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references	
Electronic References, Websites	**E-learning sites related to biology**

Course Description Form

1. Course Name:
Plant Anatomy
2. Course Code:
Biology / first stage
3. Semester / Year:
2025-2026
4. Description Preparation Date:
2/11/2025
5. Available Attendance Forms:
Class Lecture + electronic lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours
7. Course administrator's name (mention all, if more than one name)
Name: Salma Khalid Yaseen Email: Salma_yaseen@tu.edu.iq
8. Course Objectives

Course Objectives	Knowing the features and characteristics of the different anatomical tissues that make up the plant body. ..... • Acquire scientific skills in distinguishing between the anatomical structure of the roots, stems and leaves of a plant • The student understands the mechanism of growth and organ development in plants • The student's mouth features collenchyma, parenchyma, and sclerenchyma tissue
9. Teaching and Learning Strategies	
Strategy	• To provide students with knowledge of scientific goals and how to achieve them • To give the students everything that is modern in the aspect of plant anatomy that will benefit them and to learn about what is present in the science of plant anatomy.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2	Introduction to plant anatomy		Standard method, text method	Class performance and exams
2	2	Plant cell - cell wall - layers of the cell wall - click		Standard method, text method	Class performance and exams
3	2	Plant cell structure living contents		Standard method, text method	Class performance and exams
4	2	Plant cell structure non-living contents		Standard method, text method	Class performance and exams
5	2	Meristematic tissue		Standard method, text method	Class performance and exams
6	2	Permanent tissue		Standard method, text method	Class performance and exams
7	2	The growing apex in the root The growing apex of the stem		Standard method, text method	Class performance and exams
8	2	Skin texture		Standard method, text method	Class performance and exams
9	2	Types of clicking		Standard method, text method	Class performance and exams
10	2	Types of stomata		Standard method, text method	Class performance and exams
11	2	Epidermal bristles		Standard method, text method	Class performance and exams
12	2	Cork cambium		Standard method, text method	Class performance and exams
13	2	Parenchymal, collenchymal, and sclerenchymal tissue		Standard method, text method	Class performance and exams
14	2	Internal anatomy of a leaf		Standard method, text method	Class performance and exams

15	2	Internal structure of the root and stem		Standard method, text method	Class performance and exams
		final exams			

11-Course Evolution

Distributing the score out of 100 according to the tasks assigned to the student such as daily Required textbooks (methodology if available) Plant Anatomy

12-Learning and Teaching Resources

Required textbooks (curricular books, if any)	Dr. Ali Al-Moussawi and Dr. Badr Awad Al-Ani
Main references (sources)	Dr. Ahmed Aslan Al-Jundi and Dr. Abdul Fattah Hassan Salim, Ozertis Library, Cairo, 2006.
Recommended books and references (scientific journals, reports...)	(scientific journals, reports...) Plant Anatomy - Muhammad Suleiman - Dar Kunuz Ashbilia for Publishing and Distribution, Riyadh, 1424 AH
Electronic References, Websites	Electronic references, Internet sites Any electronic site related to plant anatomy

Course Description Form

1. Course Name:
Cell Biology
2. Course Code:
Bio101
3. Semester / Year:
2025-2026
4. Description Preparation Date:
2025/11/2
5. Available Attendance Forms:
Class attendance inside the classroom + attendance inside the laboratory + electronic classes on the (Google Classroom) platform, which will be a supporting class for the in-person class, according to the controls and instructions of the Ministry of Higher Education and Scientific Research
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours theory +2 hours practical Total credit units:6
7. Course administrator's name (mention all, if more than one name)
Dr.manar emad jamel Email:manaralqasimi@tu.edu.iq .....
8. Course Objectives

Course Objectives	..... •Teaching first-year students in the Biology Department the fundamentals and principles of cell biology and scientific advancements in the field. •Preparing students to teach the subject at middle and high school levels.
9. Teaching and Learning Strategies	
Strategy	Cognitive Goals 1. Understanding the close relationship between cell biology and other scientific fields such as genetics, biochemistry, zoology, and botany.

	2. Familiarizing students with biological concepts related to plant and animal cells. 3. Training students in the use of laboratory equipment. 4. Encouraging students to use various teaching methods. Skill-Based Learning Goals 1. Developing teaching skills in biology. 2. Enabling students to describe laboratory models and media. 3. Enhancing students' ability to link causes and environmental effects. Teaching Methods 1. Discussion and critical thinking. 2. Practical laboratory assessments. 3. Exploratory lecture-based learning. 4. E-learning (online quizzes and explanatory videos). Assessment Methods 1. Weekly reports. 2. Daily and periodic exams. 3. Research in cell biology.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowledge	Introduction to Cell Biology	Blackboard & Google Classroom	Daily attendance, oral questions and tests
2	2	Knowledge	,Prokaryotic & Eukaryotic Cells	Blackboard & Google Classroom	Daily attendance, oral questions and tests

3	2	Knowledge	Plasma Membrane & Models	Blackboard & Google Classroom	Daily attendance, oral questions and tests
4	2	Knowledge	Plasma Membrane Functions & Transport	Blackboard & Google Classroom	Daily attendance, oral questions and tests
5	2	Knowledge	Nuclear Structure	Blackboard & Google Classroom	Daily attendance, oral questions and tests
6	2	Knowledge	Endoplasmic Reticulum & Golgi Apparatus	Blackboard & Google Classroom	Daily attendance, oral questions and tests
7	2	Knowledge	Mitochondria & Lysosomes	Blackboard & Google Classroom	Daily attendance, oral questions and tests
8	2	Knowledge	Chromosomes	Blackboard & Google Classroom	Daily attendance, oral questions and tests
9	2	Knowledge	Chromosomal Abnormalities	Blackboard & Google Classroom	Daily attendance, oral questions and tests

10	2	Knowledge	Cell Signaling	Blackboard & Google Classroom	Daily attendance, oral questions and tests
11	2	Knowledge	,DNA Structure	Blackboard & Google Classroom	Daily attendance, oral questions and tests
12	2	Knowledge	Protein Synthesis,	Blackboard & Google Classroom	Daily attendance, oral questions and tests
13	2	Knowledge	Microtubules	Blackboard & Google Classroom	Daily attendance, oral questions and tests
14	2	Knowledge	Apoptosis	Blackboard & Google Classroom	Daily attendance, oral questions and tests
15	2	Knowledge	Cancer Cells	Blackboard & Google Classroom	Daily attendance, oral questions and tests

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .....etc	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Cell Biology, Najah Shmoo Oraha,Fadel Khali
Main references (sources)	Cell Biology: A Short Course, 2nd Edition, St
Recommended books and references (scientific journals, reports…)	Scientific journals and reports (none specifie
Electronic References, Websites	

Course Development Plan

Some courses require updates to align with local and regional developments in cell biology, including improvements in teaching methodologies and modern technology integration. Additional contemporary references will be incorporated.

Course Description Form

1. Course Name:
Comparative Anatomy of Vertebrata
2. Course Code:
Bio117
3. Semester / Year:
2026
4. Description Preparation Date:
2/11/2025
5. Available Attendance Forms:
Class lectures + electronic lectures Classroom and Google Meeting
6. Number of Credit Hours (Total) / Number of Units (Total)
90 hourse
7. Course administrator's name (mention all, if more than one name)
Name: Shurooq Hameed Majeed Alnassiri Email: shurooq_bio@tu.edu..iq

8. Course Objectives	
Course Objectives	Enabling female students to become familiar with the subject of comparative anatomy asitis one of the basic branches of life sciences. Enhancing femal students awareness of the horizons of life sciences and providing them with scientific and practical skills in their lives..

9. Teaching and Learning Strategies	
Strategy	Providing Psychological motivation to achieve scientific goals. To give the students everything that is odern in the aspect that will benefit them in the subject of comparative anatomy and benefit from it in daily life.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October 1	2	Understand the lecture topic	- Introduction - Theories of the emergence of	Standard method, text method	Class performance and exams

			chordata.		
October 2	2	Understand the lecture topic	Law of Biogenesis.	Standard method, text method	Class performance and exams
October 3	2	Understand the lecture topic	Classification of the phylum Chordata and characteristics of its main groups.	Standard method, text method	Class performance and exams
October 4	2	Understand the lecture topic	- Protochordata: their study, an example of which is the spear.	Standard method, text method	Class performance and exams
November 1	2	Understand the lecture topic	A comparative study of body systems in chordata groups The integumentary system: the structure of the skin and its components in some species of chordata.	Standard method, text method	Class performance and exams
November 2	2	Understand the lecture topic	Skin derivatives: scales, claws, beaks, feathers, hooves, nails, and horns.	Standard method, text method	Class performance and exams
November 3	2	Understand the lecture topic	Skeletal system: Skeletal system: Sections of the skeletal system	Standard method, text method	Class performance and exams

November 4	2	Understand the lecture topic	Axial structure, skull in different vertebrata.	Standard method, text method	Class performance and exams
December 1	2	Understand the lecture topic	Skeletal system: axial skeleton, spine, sternum, ribs.	Standard method, text method	Class performance and exams
December 2	2	Understand the lecture topic	Limb structure: fore limbs, hind limbs	Standard method, text method	Class performance and exams
December 3	2	Understand the lecture topic	Nervous system: Sections of the nervous Central nervous system, brain.	Standard method, text method	Class performance and exams
December 4	2	Understand the lecture topic	- Comparing the brain in vertebraa, comparing the spinal cord in different vertebrata Peripheral nervous system: spinal nerves, peripheral nerves.	Standard method, text method	Class performance and exams
January 1	2	Understand the lecture topic	A comparative study of some sense organs: nose, eyes, ears, and taste buds.	Standard method, text method	Class performance and exams
January 2	2	Understand the lecture topic	Cutaneous receptors, lateral line apparatus	Standard method, text method	Class performance and exams
January 3	2	Understand the lecture topic	Sense organs: organs of smell, organs of sight, organs of hearing, organs	Standard method, text method	Class performance and exams

			of touch, organs of taste.		
February 1	2	Understand the lecture topic	- The arterial system in various vertebrata - The venous system in various vertebrata.	Standard method, text method	Class performance and exams
February 2	2	Understand the lecture topic	The lymphatic system in various vertebrata.	Standard method, text method	Class performance and exams
March 1	2	Understand the lecture topic	Muscular system: Muscle origin - types of muscles.	Standard method, text method	Class performance and exams
March 2	2	Understand the lecture topic	Comparison of skeletal muscles in different vertebrata.	Standard method, text method	Class performance and exams
March 3	2	Understand the lecture topic	The digestive system in various vertebrata: the digestive canal: the mouth, the oral cavity, and their accessory structures, the pharynx, the stomach, and the intestines.	Standard method, text method	Class performance and exams
March 4	2	Understand the lecture topic	- Digestive glands.	Standard method, text method	Class performance and exams
April 1	2	Understand the lecture topic	Respiratory system: Comparative anatomy of	Standard method, text method	Class performance and exams

			the respiratory system in different vertebrata		
April 2	2	Understand the lecture topic	Breathing mechanics	Standard method, text method	Class performance and exams
April 3	2	Understand the lecture topic	Origin of the excretory system, types of kidneys and their structures	Standard method, text method	Class performance and exams
April 4	2	Understand the lecture topic	Comparative anatomy of the excretory system in different vertebrata.	Standard method, text method	Class performance and exams
May 1	2	Understand the lecture topic	Reproductive system: The origin of the reproductive system and its relationship to the excretory system.	Standard method, text method	Class performance and exams
May 2	2	Understand the lecture topic	- Comparative anatomy of the male reproductive system in some chordata. Comparative anatomy of the female reproductive system in some chordata.	Standard method, text method	Class performance and exams
May 3 and 4	2	Understand the lecture topic	Comparison of hermaphroditism in different vertebrata.	Standard method, text method	Class performance and exams

May 5	2	Understand the lecture topic	Final exams	Standard method, text method	Class performance and exams

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks(curricular books. If any)	Comparative anatomy of filaments/ Dr. Shukri Ali Habib Fundamentals of comparative anatomy of stipules/Dr. Shukri Habib Khalil and Abdul Zahra Kazem Abd.
Main references (sources)	Principles of animal anatomy/ Dr. Abdul Qadir Jassim Al Shaikhli and Dr. Salim Najm Omran Comparative anatomy of vertebrates/ Mr. Salah al-Din al-Nouri
Recommended books and references (scientific journals, reports…)	Zoology/ Dr. Mahmoud Ahmed Al-Banhawi Animal Physiology/ Dr. Khaled Hamid Muhammad Saeed
Electronic References, Wabsites	Embryologia and Histologial arabicwww.jarir.com And any site related to comparative anatomy of chordate

Course Description Form

1. **Course Name**:
General Chemistry - First Stage
2. **Course Code:**
3. **Semester / Year**
Annual 2025-2026
4. **Description Preparation Date:**
18/9/2025
5. **Available Attendance Forms:**
Class attendance + electronic classes on the Google Classroom platform will be a supporting class for the in-person class and according to the controls and instructions of the Ministry of Higher Education and Scientific Research.
6. **Number of Credit Hours (Total) / Number of Units (Total)**
60 hours / 2 units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Fawzi Hameed Jumaa **Email: Fawzi.99883@tu.edu.iq**
8. Course Objectives

Course Objectives • **Providing students with knowledge of the principles of thermodynamics as one of the basic branches of physical chemistry.** • **Developing students' ability by knowing the most important scientific concepts and rules that must be followed to understand the mechanisms of chemical reactions and how to control them.** • **Teaching students how to use and apply laws in the practical aspect.** • **Preparing students to practice the career of teaching chemistry in the academic institutions.**	• ..... • ..... • .....

9. Teaching and Learning Strategies

Strategy	1- The standard method (giving lectures). 2- The method of discussion and interrogation. 3- Method of solving problems. 4- Brainstorming method.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Nov. 3	1		Separation methods	Standard method And discussion	Class performance and exams
Nov. 4	1		Extraction of natural products	Standard method And discussion	Class performance and exams
Dec.1	1		Chemical equilibrium	Standard method And discussion	Class performance and exams
Dec.2	1		Ionic equilibrium-calculation pH, pOH	Standard method And discussion	Class performance and exams
Dec.3	1		Hydrolysis of salts-calculation pH	Standard method And discussion	Class performance and exams
Dec.4	1		The common ion action-buffer solutions-calculation pH	Standard method And discussion	Class performance and exams
Jan.1	1		Examination		
Jan.2	1		Methods expressing analytical concentrations	Standard method And discussion	Class performance and exams
Jan.3	1		Standard solutions-standard substances	Standard method And discussion	Class performance and exams
Jan. 4	1		Neutralization reactions	Standard method And discussion	Class performance and exams
Febru. 1	1		Neutralization reactions –used indicators	Standard method And discussion	Class performance and exams
Febru. 2	1		Precipitation reactions	Standard method And discussion	Class performance and exams
Febru. 3	1		Examination		

Febru. 4			**Spring break**	**----------**	**----------**
March 1	**1**		**Chemical bonding in carbon compounds**	**Standard method And discussion**	**Class performance and exams**
March 2	**1**		**Polar molecules and non polar molecules**	**Standard method And discussion**	**Class performance and exams**
March 3	**1**		**Single bonds- double bonds-triple bonds**	**Standard method And discussion**	**Class performance and exams**
March 4	**1**		**Stereochemistry**	**Standard method And discussion**	**Class performance and exams**
April 1	**1**		**Nomenclature of organic compounds**	**Standard method And discussion**	**Class performance and exams**
April 2	**1**		**Alkanes- structure - nomenclature**	**Standard method And discussion**	**Class performance and exams**
April 3	**1**		**Examination**		
April 4	**1**		**Preparation- reactions**	**Standard method And discussion**	**Class performance and exams**
May 1	**1**		**Alkenes- structure - nomenclature**	**Standard method And discussion**	**Class performance and exams**
May 2	**1**		**Preparation- reactions**	**Standard method And discussion**	**Class performance and exams**
May 3	**1**		**Alkynes - structure - nomenclature**	**Standard method And discussion**	**Class performance and exams**
May 4	**1**		**Preparation- reactions**	**Standard method And discussion**	**Class performance and exams**
June 1	**1**		**Aromatic hydrocarbons-benzene -reactions-**	**Standard method And discussion**	**Class performance and exams**
June 2	**1**		**Examination**		
June 3			**Final Examination**	**----------**	**----------**

11. Course Evaluation

1- Formative evaluation through daily exams, observing the student's performance in

class discussions and homework assignments, and classroom evaluation. This grade does not exceed 20% of the total. 2- Diagnostic evaluation by semester and final exams to issue judgments of success and failure. This grade is 80% and is divided into (4) semester exams during the year, that is, two exams for each semester, to extract the annual quest before entering the final exams.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1- Al-Abayji, Mu'ayyad Qasim and Al-Ghabsha, Thabit Sa'id, "Fundamentals of Analytical Chemistry," University of Mosul Press, University Press Directorate, 1988 2. - Al-Abayji, Mu'ayyad Qasim and Al-Ghabsha, Thabit Sa'id, "Descriptive and Volumetric Analysis," Higher Education Press in Mosul, Directorate of Dar Al-Kutub for Printing and Publishing, Ibn Al-Atheer Street, 1989. 3. - Daoud, Khaled Mahmoud, "Organic Chemistry", University of Mosul Press, University Press Directorate, 1988.
Main references (sources)	1.Analytical Chemistry ,Gary Christian Sixth Education 2.Analytical Chemistry ,Modern Instrumentation Method and Techniques, Francis ,second Education 3- General Chemistry, Ibraheem S.,Al.A. ,Mustafa T.A. 1st Education, Dar Al-Maysara for Publishing and Distribution, 2011.
Recommended books and references (scientific journals, reports …)	www.chemicalprocessing.com
Electronic References, Websites	https://scholar.google.com/ https://www.sciencedirect.com/

	https://www.researchgate.net/ www.bytoco.com

Course Description
Form

1. Course Name:
Curriculum and textbook for the second stage
2. Course Code:
COE
3. Semester / Year:
Annual course
4. Description Preparation Date:
2/11/2025
5. Available Attendance Forms:
Attending a class + an electronic class on GoogleClassroom will be a supporting class for the in-person class and a link to Ikmahvq according to the thinking regulations of the Ministry of Higher Education and Scientific Education.
6. Number of Credit Hours (Total) / Number of Units (Total)
hours 60/Number of weekly units 2
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Sara Mohsin mawlood Email: sara.mehsn@tu.edu.iq
8. Course Objectives

Course Objectives	The curriculum aims to prepare students to practice the teaching profession by learning about: -1Learn about educational psychology, style, motivation, and sensory perception. -2Learn about the types of educational psychology. -3How to formulate behavioral goals.

	- 4Knowledge of educational schools. 5 - The importance of educational applications of learning theories..

9. Teaching and Learning Strategies	
Strategy	The standard method (giving lectures). 1 - Lecture method. 2 - The method of discussion and interrogation. 3- Brainstorming method.

10. Course Structure The study began on 20/9/2025 and ends on 19/5/2026, the start date of final exams.

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	The student's understanding of the lesson	Curriculum	Discussion and questioning	Class performance and exams
2	2	The student's understanding of the lesson	Definition of curriculum	Discussion and questioning	Class performance and exams
3	2	The student's understanding of the lesson	Foundations of curriculum construction	Psychological storming	Class performance and exams
4	2	The student's understanding of the lesson	Elements of the school curriculum	Discussion and questioning	Class performance and exams
5	2	The student's understanding of the lesson	Educational goals	Discussion and questioning	Class performance and exams
6	2	The student's understanding of	Content	Discussion and questioni	Class performance and

		the lesson		ng	exams
7	2	The student's understanding of the lesson	Teaching methods	Discussion and questioning	Class performance and exams
8	2	The student's understanding of the lesson	Counseling areas	Discussion and questioning	Class performance and exams
9	2	The student's understanding of the lesson	Teaching aids	Problem Solving	Class performance and exams
10	2	The student's understanding of the lesson	Accompanying activities	Discussion and questioning	Class performance and exams
11	2	student's The understanding of the lesson		Discussion and questioning	Class performance and exams
12	2	The student's understanding of the lesson	Calendar	Discussion and questioning	Class performance and exams
13	2	The student's understanding of the lesson	Curriculum theory	Discussion and questioning	Class performance and exams
14	2	The student's understanding of the lesson	Definition of method theory	Discussion and questioning	Class performance and exams
15	2	The student's understanding of the lesson	Types of curriculum theories	Discussion and questioning	Class performance and exams

16	2	The student's understanding of the lesson	Traditional curriculum theories	Discussion and questioning	Class performance and exams
17	2	The student's understanding of the lesson	Modern progressive theories	Discussion and questioning	Class performance and exams
18	2	The student's understanding of the lesson	The traditional concept of curriculum	Discussion and questioning	Class performance and exams
19	2	The student's understanding of the lesson	Factors that led to the development of the curriculum	Discussion and questioning	Class performance and exams
20	2	The student's understanding of the lesson	The modern concept of the curriculum	Discussion and questioning	Class performance and exams
21	2	The student's understanding of the lesson	Types of curricula	Discussion and questioning	Class performance and exams
22	2	The student's understanding of the lesson	Curricula revolve around the academic subject	Discussion and questioning	Class performance and exams
23	2	The student's understanding of the lesson		Discussion and questioning	Class performance and exams
24	2	The student's understanding of the lesson	Curricula that revolve around the learner and his experience	Discussion and questioning	Class performance and exams
25	2	The student's understanding of	Curriculum content organisations,	Discussion and questioni	Class performance and

		the lesson		ng	exams
26	2	The student's understanding of the lesson	Curriculum and globalization	Discussion and questioning	Class performance and exams
27	2	The student's understanding of the lesson	Curriculum and human rights	Discussion and questioning	Class performance and exams
28	2	The student's understanding of lesson the	The concept of curriculum evaluation	Discussion and questioning	Class performance and exams
29	2	The student's understanding of the lesson	Textbook elements	Psychological storming	Class performance and exams
30	2	The student's understanding of the lesson	Methods of writing a textbook	Discussion and questioning	Class performance and exams

11. Course evaluation

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

The degree is distributed through several channels:

1- Formative (formative) assessment through daily exams, observing and following up on the student's performance in class discussions and homework assignments, and classroom evaluation. Her grade does not exceed 20% of the total.

2- Diagnostic evaluation of the semester and final exams to issue judgments of success and failure. This grade is 80% and is divided into (4) exams for each

Course Description Form

1. Course Name: Microbiology	
2. Course Code: Bio 121	
3. Semester / Year:2025	
4. Description Preparation Date: 2/11/2025	
5. Available Attendance Forms: Class attendance inside the classroom + attendance inside the laboratory + electronic classes on the Google platform classroom) will be a supporting class for the attendance class and according to the controls and instructions of the Ministry of Higher Education and Research	
6. Number of Credit Hours (Total) / Number of Units (Total) 60 hours/2 units	
7. Course administrator's name (mention all, if more than one name) Sarah Abdel Hamid Hassan Ali Sarah.Abdulhameed235@tu.edu.iq	
....	
8. Course Objectives	
Course Objectives	1- Developing students' ability to follow and understand speech Developing their ability to distinguish between main ideas And high school. 2- Urging students to obtain knowledge Information and the ability to draw conclusions. 3- Developing their abilities to make quick summaries Comprehensive aspects of the topic. 4- Introducing students to bacterial groups, their importance and harm. 5-Bacterial diagnosis and classification. 6- Introducing students to the types of bacteria and distinguishing between them.
9. Teaching and Learning Strategies	

Strategy	It can be defined as a set of strategic rules. It can be defined as a set of general rules and broad lines that concern the means of achieving The desired goals of teaching refer to the methods and plans followed by faculty members to reach learning goals.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		An introductory introduction to microbiology	Standard method	Class performance and exams
2	2		Learn about laboratory equipment, how to use them, and what their purpose is Knowledge of laboratory safety precautions	Practical lesson in the laboratory	practical application
3	2		Sterilization	Standard method	Class performance and exams
4	2		Chemical sterilization	Standard method	Class performance and exams
5	2		Physical sterilization	Standard method	Class performance and exams
6	2		Bacterial growth in culture medium	Practical lesson in the laboratory	practical application
7	2		Diagnosis of bacteria on solid media	Practical lesson in the laboratory	practical application
8	2		Diagnosis of bacteria on liquid media	Practical lesson in the laboratory	practical application
9	2		Bacterial movement	Practical lesson in the laboratory	practical application
10			Application in school		
11			Application in school		

12			Application in school		
13			Application in school		
14			Application in school		
15			Application in school		
16			Application in school		
17			Application in school		
18	2		Bacteria shapes	Standard method	Class performance and exams
19	2		Bacterial staining	lesson in the laboratory	practical application
20	2		Antibiotic sensitivity testing	lesson in the laboratory	practical application
21	2		Quantification of sensitivity	lesson in the laboratory	practical application
22	2		Microbiological examination of water	Standard Method	Class performance and exams
23	2		Sources of water pollution	Standard method	Class performance and exams
24	2		Isolation and enumeration of water bacteria	lesson in the laboratory	practical application
25	2		Bacterial census	Standard method	Class performance and exams
26	2		Some important bacterial genera in soil	Standard method	Class performance and exams
27	2		Factors affecting the presence of bacteria in soil	Standard method	Class performance and exams

28	2		Viruses	Standard method	Class performance and exams
29	2		Methods for diagnosing viruses	Standard method	Class performance and exams

11. Course Evaluation

The grade distribution out of 15 is as follows: First semester exam of 6 and daily exam score

Second semester exam of 7 and grade on reports

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	laboratory manual and workbook in Microbiolog
Recommended books and references (scientific journals, reports…)	Microbiology Dr. Amin Salman Badawi Microbiology principles and Explorations
Electronic References, Websites	Prescott

semester, two exams, to extract the annual endeavor before entering the final exams.	
12. Learning and teaching resources	
Required textbooks (methodology, if any)	Lessons and textbook, Prof. Dr. Dawoud Abdel Salam Sabry and Prof. Dr. Zainab Hamza Naji / 2011
Main references (sources)	1- The curriculum and textbook, Prof. Dr. Muhammad Abdel Wahab and Eng. Batoul Fadel Jawad / 2018 2- Curriculum and textbook, Prof. Dr. Rahim Ali Saleh, M.D. Turkish Sky Inside ./ 2018 3- The contemporary school curriculum (its concept, foundations) by Dr. Hassan .Jaafar Al-Khalifa 4- Modern Educational Curricula, Tawfiq Ahmed Mar'i and Muhammad Mahmoud / Al-Haila
Recommended supporting books and references (scientific journals, reports...)	Access to everything recent and published in peer-reviewed scientific journals
Electronic references, Internet sites	