

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



Academic Program and Course Description Guide

2024

Introduction

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

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

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

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

Concepts and Terminology

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

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

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

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

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

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

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

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

Academic Program Description Form

University Name: University of Diyala
Faculty/Institute: College of Science
Scientific Department: Biology
Academic or Professional Program Name:
Assis. Prof Dr. Esam Hamid Hameed

Final Certificate Name:
Academic System: BSc.
Description Preparation Date: 1/4/2024
File Completion Date: 1/4/2024

Signature: 
Head of Department Name:
Assis. Prof. Esam Hamid Hameed
Date:

Signature: 
Scientific Associate Name:
Prof. Dr. Munther Hamza Rathi
Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance

Department:
Date:
Signature:



Approval of the Dean

1. Program Vision

Program vision is written here as stated in the university's catalogue and website.

2. Program Mission

Program mission is written here as stated in the university's catalogue and website.

3. Program Objectives

General statements describing what the program or institution intends to achieve.

4. Program Accreditation

Does the program have program accreditation? And from which agency?

5. Other external influences

Is there a sponsor for the program?

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	4	9	%7.4	
College Requirements	6	35	%28.9	
Department Requirements	38	121	%100	
Summer Training	-	Pass		
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
First/1 st	Bio-1101	General Zoology	2	2
	Bio-1102	Analytical Chemistry	2	2
	Bio-1103	General Mathematics	2	2
	Bio-1104	Biophysics	2	2
	Bio-1105	Human Rights and Democracy	2	2
	Bio-1106	Arabic Language	2	2
First/2 nd	Bio-1201	General Botany	2	2
	Bio-1212	Organic Chemistry	2	2
	Bio-1213	Biostatistics	2	2
	Bio-1204	Safety and Biosecurity	2	2
	Bio-1205	Computer Science	2	2
	Bio-1206	English Language	2	2
Second/1 st		Entomology I	2	2
		Plant Anatomy	2	2
		Invertebrates	2	2
		Plant Groups	2	2
		Biochemistry I	2	2

		Microbiology I	2	2
Second/2nd		Entomology II	2	2
		Plant Taxonomy	2	2
		Parasitology	2	2
		Biochemistry II	2	2
		Microbiology II	2	2
		Cytology	2	2
Third/1st		Ecology	2	2
		Histology	2	2
		Mycology I	2	2
		Plant Physiology	2	2
		Immunology	2	2
		Microbiology (Aquatic and Soil)	2	2
Third/2nd		Pollution	2	2
		Animal Physiology	2	2
		Mycology II	2	2
		Microbial Physiology	2	2
		Genetics	2	2
		Molecular Biology	2	2
Fourth/1st		Pathogenic Bacteriology	2	2
		Food Microbiolog	2	2
		Comparative Anatomy	2	2
		Clinical Analysis	2	2
		Antibiotic	2	2
		Microbial Genetics	2	2
Fourth/2nd		Biotechnology	2	2
		Industrial Microbiology	2	2
		Embryology	2	2
		Optional Subject	2	2
		Virology	2	2
		Research Project	2	2

8. Expected learning outcomes of the program

Knowledge

Learning Outcomes 1	Learning Outcomes Statement 1
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Skills

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

Learning Outcomes 4	Learning Outcomes Statement 4
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Learning Outcomes 5	Learning Outcomes Statement 5
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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.

11. Faculty					
Faculty Members					
Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer
Professor	Biology	Microbiology		3	
Professor	Biology	Plant Taxonomy		1	
Professor	Biology	Genetics		1	
Professor	Biology	Ecology		1	
Assistant Professor	Biology	Biotechnology		1	
Assistant Professor	Biology	Microbiology		7	
Assistant Professor	Biology	Botany		1	
Assistant Professor	Biology	Histology		1	
Assistant Lecturer	Biology	Entomology		1	
Lecturer	Biology	Zoology		4	
Lecturer	Biology	Microbiology		1	
Lecturer	Biology	Biochemistry		1	
Assistant Lecturer	Biology	Microbiology		9	
Assistant Lecturer	Biology	Zoology		9	
Assistant Lecturer	Biology	Botany		5	

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

Program Skills Outline

				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or Optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First	Bio-1101	General Zoology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	Bio-1102	Analytical Chemistry	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	Bio-1103	General Mathematics	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	Bio-1104	Biophysics	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	Bio-1105	Human Rights and Democracy	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	Bio-1106	Arabic Language	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	Bio-1201	General Botany	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	Bio-1212	Organic Chemistry	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	Bio-1213	Biostatistics	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	Bio-1204	Safety and Biosecurity	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	Bio-1205	Computer Science	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	Bio-1206	English Language	Basic	√	√	√	√	√	√	√	√	√	√	√	√
Second		Entomology I	Basic	√	√	√	√	√	√	√	√	√	√	√	√
		Plant Anatomy	Basic	√	√	√	√	√	√	√	√	√	√	√	√
		Invertebrates	Basic	√	√	√	√	√	√	√	√	√	√	√	√
		Plant Groups	Basic	√	√	√	√	√	√	√	√	√	√	√	√
		Biochemistry I	Basic	√	√	√	√	√	√	√	√	√	√	√	√
		Microbiology I	Basic	√	√	√	√	√	√	√	√	√	√	√	√
		Entomology II	Basic	√	√	√	√	√	√	√	√	√	√	√	√
		Plant Taxonomy	Basic	√	√	√	√	√	√	√	√	√	√	√	√
		Parasitology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
		Biochemistry II	Basic	√	√	√	√	√	√	√	√	√	√	√	√
		Microbiology II	Basic	√	√	√	√	√	√	√	√	√	√	√	√

Third		Cytology	Basic	√	√	√	√	√	√	√	√	√	√	√	√	
		Ecology	Basic	√	√	√	√	√	√	√	√	√	√	√	√	√
		Histology	Basic	√	√	√	√	√	√	√	√	√	√	√	√	√
		Mycology I	Basic	√	√	√	√	√	√	√	√	√	√	√	√	√
		Plant Physiology	Basic	√	√	√	√	√	√	√	√	√	√	√	√	√
		Immunology	Basic	√	√	√	√	√	√	√	√	√	√	√	√	√
		Microbiology (Aquatic and Soil)	Basic	√	√	√	√	√	√	√	√	√	√	√	√	√
		Pollution	Basic	√	√	√	√	√	√	√	√	√	√	√	√	√
		Animal Physiology	Basic	√	√	√	√	√	√	√	√	√	√	√	√	√
		Mycology II	Basic	√	√	√	√	√	√	√	√	√	√	√	√	√
		Microbial Physiology	Basic	√	√	√	√	√	√	√	√	√	√	√	√	√
		Genetics	Basic	√	√	√	√	√	√	√	√	√	√	√	√	√
Fourth		Molecular Biology	Basic	√	√	√	√	√	√	√	√	√	√	√	√	
		Pathogenic Bacteriology	Basic	√	√	√	√	√	√	√	√	√	√	√	√	
		Food Microbiolog	Basic	√	√	√	√	√	√	√	√	√	√	√	√	
		Comparative Anatomy	Basic	√	√	√	√	√	√	√	√	√	√	√	√	
		Clinical Analysis	Optional	√	√	√	√	√	√	√	√	√	√	√	√	
		Antibiotic	Basic	√	√	√	√	√	√	√	√	√	√	√	√	
		Microbial Genetics	Basic	√	√	√	√	√	√	√	√	√	√	√	√	
		Biotechnology	Basic	√	√	√	√	√	√	√	√	√	√	√	√	
		Industrial Microbiology	Basic	√	√	√	√	√	√	√	√	√	√	√	√	
		Embryology	Basic	√	√	√	√	√	√	√	√	√	√	√	√	
		Optional Subject	Optional	√	√	√	√	√	√	√	√	√	√	√	√	
		Virology	Basic	√	√	√	√	√	√	√	√	√	√	√	√	
	Research Project	Basic	√	√	√	√	√	√	√	√	√	√	√	√		

■ Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

Course Description Form

1. Course Name:					
General Zoology					
2. Course Code:					
Bio-1101					
3. Semester/Year:					
Semester 1					
4. Description Preparation Date:					
1/11/2023					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
150 hours / 3 units					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis.Prof.Dr. Ragad Ibrahim Ahmed					
Email: raghadibrahim@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		<ol style="list-style-type: none"> 1. Understand the difference between science and non-science. 2. Be familiar with the specialized vocabulary of zoology. 3. Understand the relationship between animal structure and function. 4. Know the structural and functional characteristics of major animal groups, and be familiar with current hypotheses concerning how they evolved 			
9. Teaching and Learning Strategies					
Strategy		<ol style="list-style-type: none"> 1. Lecture method, use of the interactive whiteboard, presentation, and use of explanatory films - explanation and clarification 2. Asking students a set of questions about animal classification, phylum, family, order, and class during the lectures, such as what, how, when and why for specific topics. 			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		Introduction : Define Of General Zoology And Its Relationship With Other Sciences	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	4		Characteristics Of Living	=	=
			Things		
3	4		Prokaryotic And Eukaryotic Cells	=	=
4	4		Cell Cycle, Mitosis	=	=

5	4		Animal Cells And Animal Tissues	=	=
6	4		Taxonomy And Classification Of Animals	=	=
7	4		Mid-Term Exam	=	=
8	4		Animal Phyla,1. The Protozoa	=	=
9	4		The Parazoa	=	=
10	4		The Radiata	=	=
11	4		The Acoelomates	=	=
12	4		The Pseudocoelomates	=	=
13	4		The Coelomates: Protostomes	=	=
14	4		The Coelomates: Deuterostome	=	=
15	4		Preparatory Week Before The Final 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)	Huxley, T. H. (2022). On the study of zoology. DigiCat.
Main References (sources)	Nicholson, H. A. (2022). A manual of zoology. BoD–Books on Demand. Honegger, T. (2022). Zoology.
Recommended Books and References (scientific journals, reports ... etc.)	
Electronic References (websites ... etc.)	https://alison.com/tag/biology https://www.brianbrookshire.com/online-biology-curriculum

Course Description Form

1. Course Name:

Analytical Chemistry

2. Course Code:

Bio-1102

3. Semester/Year:

Semester 1

4. Description Preparation Date:

1/11/2023

5. Available Attendance Forms:

weekly

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

150 hours / 3 units

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

Name: Assis. Prof. Dr. Ragad Ibrahim Ahmed

Email: raghadibrahim@uodiyala.edu.iq

8. Course Objectives**Course Objectives**

The primary objective of this course is to acquire basic concepts, principles, and techniques of modern analytical chemistry that would empower students with an analytical mind set and the abilities to solve diverse analytical problems in an efficient and quantitative way that conveys the importance of accuracy and precision of the analytical results. On successful completion of this course, students will be able:

1. to develop an understanding of the range and uses of analytical methods in chemistry.
2. to establish an appreciation of the role of chemistry in quantitative analysis
3. to develop an understanding of the broad role of the chemist in measurement and problem solving for analytical tasks.
4. to provide an understanding of chemical methods employed for elemental and compound analysis.
5. to provide experience in some scientific methods employed in analytical chemistry.
6. to develop some understanding of the professional and safety responsibilities residing in working on chemical analysis.

9. Teaching and Learning Strategies**Strategy**

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		Introduction to analytical chemistry	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	4		Solutions and classification of solutions	=	=
3	4		Express concentrations of solutions	=	=
4	4		Density and specific gravity of solution	=	=
5	4		The relationship between molarity or normality with percentage	=	=
6	4		concentration	=	=
7	4		Diluting solutions	=	=
8	4		Solve of some Problems	=	=
9	4		Concentration by percent	=	=
10	4		P -functions	=	=
11	4		Volumetric analysis	=	=
12	4		Standard solution	=	=
13	4		Acid –Base equilibrium	=	=
14	4		Buffer solution	=	=
15	4		Enthalpy	=	=

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)	Alam, M., Akhtar, M., & Asif, H. (2012). Textbook of Practical Analytical Chemistry-E- Book. Elsevier Health Sciences. Christian, G. D., Dasgupta, P. K., & Schug, K. A. (2013). Analytical chemistry. John Wiley & Sons.
Main References (sources)	Hussain, M. (2023). CHEM 221-001: Analytical Methods.
Recommended Books and References (scientific journals, reports ... etc.)	
Electronic References (websites ... etc.)	https://edu.rsc.org/teacher-pd/in-person/analytical-chemistry/classroom-resources

Course Description Form

1. Course Name:	
Biophysics	
2. Course Code:	
Bio-1104	
3. Semester/Year:	
Semester 1	
4. Description Preparation Date:	
1/11/2023	
5. Available Attendance Forms:	
weekly	
6. Number of Credit Hours (Total)/Number of Units (Total)	
150 hours / 3 units	
7. Course Administrator's Name (mention all, if more than one name)	
Name: Amera Kanan Email: amera@uodiyala.edu.iq	
8. Course Objectives	
Course Objectives	<p>In this module we will review in detail several important modern physical science concepts, models, laws, tools and techniques that can be applied to addressing real biological questions, with a thorough discussion of the underlying physics.</p> <p>Physical science methods historically have been key to providing enormous breakthroughs in our understanding of fundamental biology - stemming from the early development of optical microscopy in understanding the cellular nature of life, through to complex structural biology techniques to elucidate the shape of vital biomolecules including proteins and DNA.</p> <p>In the first half of this module we will introduce the key biological macromolecules, the forces that are involved in maintaining their structure and how structure is determined. We will next discuss key physical science developments that have involved methods to study single cells in their native context, single- molecule biophysical methods that permit dynamic and mechanistic information to be extracted with unprecedented precision, and ground-breaking developments in areas of super-resolution imaging and biosensing.</p> <p>In the second half of the module we will discuss tools and techniques that, broadly, permit the detection and characterization of biological material using non-visible electromagnetic radiation, and methods used to manipulate and quantify biological forces, with particular emphasis throughout placed on real applications. Examples of such tools discussed include electron microscopy, nuclear magnetic resonance spectroscopy and atomic force microscopy</p>
9. Teaching and Learning Strategies	
Strategy	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		The lecture course will discuss the scope of modern biophysics, and introduce students to the fundamentals of chemical bonding	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	4		The structure and function of biological molecules including sugars, lipids, proteins, nucleic acids and molecular machines.	=	=
3	4		Biophysical techniques including optical spectroscopy, dynamic light scattering	=	=
4	4		Fluorescence spectroscopy and the basics of light microscopy will then be discussed in detail.	=	=
5	4		properties of fluids: pressure, buoyancy, Archimedes' rule, ideal fluid flow , Bernoulli equation, Venturi tube,	=	=
6	4		Medical needles, Pitot tube	=	=
7	4		real fluid viscosity and flow, Viscosity modulus, viscosity changes with degree	=	=
8	4		Heat, Brazier's law,	=	=
9	4		flow rate the blood and its relationship with pressure slope, velocity	=	=
10	4		sedimentation	=	=
11	4		fluid properties: fluid diffusion, Vic's Fluid Law, Maturity, Laws Maturity, boiling point of solutions	=	=
12	4		fluid properties: surface tensile, Surface tensile modulus, some live applications	=	=
13	4		Vibratory motion, force constant, motion Simple	=	=

			harmonic, potential energy and kinematics in simple harmonic motion		
14	4		fading or fading, resonance	=	=
15	4		wave motion, sine wave equation,	=	=

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)	Leake MC: Biophysics: tools and techniques (CRC Press, 1st Ed, 2016) Leake MC: Single-Molecule Cellular Biophysics (CUP, 1st Ed, 2013)
Main References (sources)	Alberts A et al: Molecular Biology of the Cell (Garland Science, 6th Ed, 2014).
Electronic References (websites ... etc.)	https://www.coursera.org/browse/physical-science/

Course Description Form

1. Course Name:					
General Mathematics					
2. Course Code:					
Bio-1103					
3. Semester/Year:					
Semester 1					
4. Description Preparation Date:					
1/11/2023					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
125 hours / 2 units					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis.Prof.Dr. Dr. Anwar Nouruddin Imran					
Email: anwarmath@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		The aim of the General Mathematics course is to prepare students for tertiary study in a variety of areas where an ability to critically analyse information and work with data is inherent. Students with tertiary pathways into areas such as Health, Science, Psychology and Commerce would benefit from studying this course			
9. Teaching and Learning Strategies					
Strategy		Conducting fun scientific competitions (individual or team). Organizing lectures prepared by students. Formation of volunteer work groups. Scientific trips.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		laws of derivative	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	2		higher derivative and Implicit deferential	=	=
3	2		chain Rule	=	=
4	2		derivative of triangle function	=	=
5	2		derivative of hyperbolic function and derivative of invers	=	=

6	2		derivative of inverse hyperbolic function	=	=
7	2		derivative of logarithms and exponential	=	=
8	2		laws of Integral	=	=
9	2		the integration of triangle function	=	=
10	2		the integration of inverse triangle function	=	=
11	2		the integration of hyperbolic function	=	=
12	2		the integration of inverse hyperbolic function	=	=
13	2		the integration of logarithms and exponential function	=	=
14	2		The methods of integration	=	=
15	2		tabular integration, Trigonometric integration, Trigonometric substitution	=	=

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)	<ol style="list-style-type: none"> 1. "Discrete Mathematics and Its Applications" by Kenneth H. Rosen, 2007. 2. "Discrete Mathematics Demystified" by Steven G. Krantz, 2009. 3. "Fundamental Concepts of Modern Mathematics" by Max D. Larsen.
Main References (sources)	4. "Discrete Mathematics- Schaum's Outline" by S. Lipschutz and M. Lipson, 2007.
Electronic References (websites ... etc.)	https://www.syriamath.net/library

Course Description Form

1. Course Name:					
Human Rights, Freedom and Democracy					
2. Course Code:					
Bio-1105					
3. Semester/Year:					
Semester 1					
4. Description Preparation Date:					
1/11/2023					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
75 hours / 2 units					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assist. Prof.Dr. Othman Khlan Frhan Email: othaman@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		<ol style="list-style-type: none"> 1.The course aims to introduce students to human rights, freedom and democracy, its most prominent sources and characteristics, and the historical stages that human rights, freedom and democracy went through. 2.Then get acquainted with the Universal Declaration of Human Rights and the most prominent articles included in the Declaration, international treaties and covenants and the most prominent international organizations. 3.The most important international conventions in the field of human rights, freedom and democracy, and introducing students to human rights in the monotheistic religions (Christian, Islamic religion) and other religions. 4.And then emphasizing democracy and how to practice democracy in a newly democratic society, so that students are the nucleus of the future in building the Iraqi state. 			
9. Teaching and Learning Strategies					
Strategy		Methods of teaching and learning - The electronic lecture on Google meet using Google Classroom. Explanation and clarification. Brainstorming			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		The first topic: definition of human rights Concept of human rights, definition of human rights.- definition of right- definition of human being- definition of concept of human rights). The importance of studying human rights, characteristics of human rights.	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests

2	2		Generations of human rights (the first generation is the generation of civil and political rights, the second generation is the generation of economic, social and cultural rights, and the third generation is the generation of new rights).	=	=
3	2		The second topic: the historical development of human rights Human rights in the civilizations of Mesopotamia (the law of Urkagina and Urnammu, the law of Ishtar, the law of the kingdom of Eshnunna, the law of Hammurabi's law), human rights in other ancient civilizations (the Indian and Chinese civilization, the civilization of Pharaonic Egypt, the Greek civilization and the Roman civilization).	=	=
4	2		The third topic: Human rights in Islam (the rights of the child, women, social, economic and political rights). Human rights in the Middle Ages, human rights in divine laws, in Judaism and Christianity, human rights at the level of modern revolutions and legitimacy.	=	=
5	2		The fourth topic: Recognition of human rights at the international level, stages of international recognition of human rights, contemporary regional recognition.	=	=
6	2		The fifth topic: human rights at the European level, the American level, the African level, and the Arab and Islamic level, explaining the paragraphs and articles of the Universal Declaration of Human Rights in 1948.	=	=
7	2		international and regional conventions and national legislation, including (the Universal Declaration of Human Rights, human rights in the two international covenants).	=	=
8	2		The seventh topic: the emergence of non-governmental organizations and their role in the field of human rights (the International Committee of the Red Cross, Amnesty International, Human Rights Watch, Arab Organization for Human Rights Watch).	=	=
9	2		The eighth topic: the definition of democracy, the concept of democracy, the advantages of democracy, the historical development of democracy and freedom in ancient historical times (Mesopotamia civilization, the Nile Valley civilization, the Greek civilization, the Roman civilization)	=	=
10	2		The ninth topic: the stages of the democratic system in Iraq, the most important articles of the Iraqi constitution of 2005 AD in the field of democracy and human rights. The relationship between the general rights and freedoms of individuals and democracy, the difference between freedom evaluates the democratic system and the stages of its implementation in Iraq (pros of democracy, negatives of democracy)	=	=

11	2		Topic 10: Types of Democracy (First - Direct Democracy, Second - Indirect Democracy, divided into: A - semi-direct democracy, b - indirect democracy, and its most important advantages and disadvantages (representative democracy (parliamentary), consensual democracy, delegated democracy).	=	=
12	2		Table Eleven: General conditions for the success of the democratic system (respect for human rights, political pluralism, peaceful transfer of power) (political equality, respect for the principle of democracy, and the existence of the rule of law).	=	=
13	2		The twelfth topic: the components and pillars of democracy (citizenship, political participation, elections, representatives and responsibility) (contestation, constitutional legitimacy, separation of powers, transparency and accountability).	=	=
14	2		The thirteenth topic: the concept of elections and their legal adaptation (election conditions, concepts specific to elections, electoral administration). (General principles of electoral administration, election systems, majority system and proportional representation).	=	=
15	2		The fourteenth topic: administrative corruption, its concept and definition, types of corruption, causes of corruption, treatments for corruption, some political terms (constitutional court, presidential system, parliamentary system, federal union, secularism, technocracy, aristocracy, liberalism, bureaucracy, imperialism).	=	=

Main References (sources)	
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Electronic References (websites ... etc.)	
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Course Description Form

1. Course Name:

Arabic Language

2. Course Code:

Bio-1106

3. Semester/Year:

Semester 1

4. Description Preparation Date:

1/11/2023

5. Available Attendance Forms:

weekly

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

11 hours / 2 units

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

Name: Assist. Prof. Dr. Othman Khlan Frhan

Email: othaman@uodiyala.edu.iq

8. Course Objectives

Course Objectives	<p>-1 Introducing students to the most important basic keys in dealing with an eloquent Arabic language free from any error or melody, and how to learn in terms of literature, grammar, rhetoric, and Arabic dictation, and all of this is for non-specialists.</p> <p>2- Raising students' expressive abilities, increasing their linguistic wealth, and helping them to use the appropriate phrase in a clear and semantic manner.</p> <p>3- Training the students to speak, and the logical organization of ideas, while being careful to adhere to the classical Arabic language.</p> <p>4- Raising students' general linguistic performance.</p> <p>- Enabling students to write, express and speak in an eloquent and clear Arabic language.</p> <p>6- Helping students express their ideas through discussion and dialogue in an easy and eloquent language.</p> <p>7- Making students able to acquire a linguistic storehouse of eloquent words, expressions and expressions.</p> <p>8- Students learned to preserve the language of the Qur'an, the original Arab heritage.</p>
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9. Teaching and Learning Strategies

Strategy	<ul style="list-style-type: none"> -Lecture and participation. -Discussion and dialogue. -Brainstorming. -Writing reports on the subject. --Question and answer
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Explain the importance of the	Lecture	Introduction

			Arabic language and its benefits to the university student. Language, memorizing, interpreting and analyzing the first ten verses of Surat al-Kahf, with an explanation of the virtue of the surah, the reason for its name, and the most important rhetorical and grammatical aspects.	,demonstrations ,interactive discussion and self-education	to computer, basic definition ,interactive discussion and oral and written tests
2	2		Language, memorizing, interpreting and analyzing three verses of Surat al-Hujurat, with an explanation of the virtue of the surah, the reason for its name, and the most important rhetorical and grammatical aspects.	=	=
3	2		Literature, memorization and analysis of thirteen lines from the poem Safar Ayoub in the free poetry of the Iraqi poet Badr Shaker al-Sayyab with the life of the poet and the most important rhetorical and grammatical aspects of the poem.	=	=
4	2		Literature, memorization and analysis of eight verses in the enthusiasm of the poet Abi al- Tayyib al-Mutanabbi with the life of the poet with the most important rhetorical and grammatical aspects of the poem.	=	=
5	2		Arabic grammar and its importance Know the parts of speech (noun, verb and letter) and their most important signs.	=	=
6	2		Arabic grammar: indefiniteness and knowledge, types of knowledge (knowledge). Explanation of the topic (the noun of knowledge and the compound noun) with examples.	=	=
7	2		Arabic grammar, (pronouns), explaining the topic (nominative, accusative and prepositional pronouns) with examples.	=	=
8	2		Language, memorizing,	=	=
			interpreting and analyzing Surat Al-Ala with an explanation of the virtue of the surah, the reason for its name, and the most important rhetorical and grammatical aspects.		

9	2		Literature, memorizing and analyzing eight verses from the poem (Be Balsamah) by the poet (Elia Abi Madi) with the life of the poet with the most important syntactic and rhetorical cases.	=	=
10	2		Arabic grammar, explaining the subject of (declarative nouns) with examples and cases of inflection, explaining the subject of (the identifier in addition) with examples and cases of inflection.	=	=
11	2		Arabic grammar, explaining the topic (al-hal), knowing the adverb and its owner, and what are the types of adverb with examples and cases of inflection.	=	=
12	2		Spelling in the Arabic language, punctuation marks and their importance in the Arabic language.	=	=
13	2		Arabic grammar, explaining the topic (number), knowing the distinction of the number and what are the divisions of the number, with examples and cases of expression.	=	=
14	2		Orthography in the Arabic language, the provisions of the hamza (Hamza al-Wasl, Hamza al-Qat', writing the hamza in the middle of the word.)	=	=
15	2		Spelling in the Arabic Language: Rulings on Writing Dhaad and Dhaa.	=	=

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)	<ol style="list-style-type: none"> 1. The Holy Quran. 2. The Book of Rhetoric and Application. 3. The Clear Dictation Book. 4. The Arabic language curriculum for non- specialists.
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<p>Main References (sources)</p>	<ol style="list-style-type: none"> 1. The Book of Explanation of Ibn Aqeel on Al- Fayya Ibn Malik / Ibn Aqeel Abdullah Bin Abdul Rahman. 2. The Book of Facilitator in the Arabic Language for Non-Professionals / Dr. Ziyad Tariq Shuli 3. The Clear Spelling Book / by Dr. Abbas Hasan. Curriculum of the General Arabic Language for Non-Specialists / Abdel Qader Hassan Amin
<p>Electronic References (websites ... etc.)</p>	<ol style="list-style-type: none"> 1- Al-Mustafa Library http://www.al-mostafa.com/index.htm 2- Mishkat Al-Islam Library http://www.almeshkat.net/books/index.php 3- Scientific Society for the Arabic Language http://www.imamu.edu.sa/arabiyah 4- Picture Book Forums http://pdfbooks.net/vb/login.php

Course Description Form

1. Course Name:					
General Botany					
2. Course Code:					
Bio-1201					
3. Semester/Year:					
Semester 2					
4. Description Preparation Date:					
8/6/2023					
5. Available Attendance Forms:					
Weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
175hours / 3 units					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis. Prof. Dr. Khalid Dheyaa Abdulwahid					
Email: chechanikd75@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		<p>1-Learn about plants in nature and how they are classified and developed. 2- Identify the plant cell and its various components. 3-Identify plant tissues and their functions. 4- Identify the different parts of the plant. 5- Studying photosynthesis in plants. 6-Granting the student a bachelor's degree in the theoretical and practical aspects.</p>			
9. Teaching and Learning Strategies					
Strategy		<p>Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.</p>			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		Introduction of Botany - Origin and development- Systematics and classification	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive

					discussion and oral and written tests
2	4		The nature of plant - Photosynthetic organisms – Vegetabilia kingdom -Fully parasitic plants	=	=
3	4		The plant cell : Introduction to Cells-Cell theory- Types of microscopy - Cell membrane and wall	=	=
4	4		The plant cell: Nucleus- Nucleolus-Chromosomes.	=	=
5	4		The plant cell: Ribosomes- Protein Synthesis -Rough endoplasmic reticulum- Golgi apparatus.	=	=
6	4		The plant cell: Life Cycle - karyokinesis, cytokinesis- Meiosis, Mitosis, Mitochondria and Chloroplasts	=	=
7	4		The plant cell: Vacuoles and other Vesicles - Cellular Skeleton	=	=
8	4		Mid exam	=	=
9	4		Tissues of plant: Epidermis- Ground tissues- Supportive tissues- Meristems	=	=
10	4		Tissues of plant: Vascular tissues- Periderm	=	=
11	4		Organs of plant: Roots - Roots forms- Modification of roots - Anatomy of root	=	=
12	4		Organs of plant: Stems- Modification of stems - Anatomy of stem	=	=
13	4		Organs of plant: Leaves - Leaves form - Anatomy of leaves, Flowering plants	=	=
14	4		Photosynthesis	=	=
15	4		Final 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)

Introduction to Botany, Alexey Shipunov
Shipunov, Alexey. Introduction to Botany.
Lecture notes. February 8, 2018 version

Main References (sources)	BOTANY ,TAMIL NADU TEXTBOOK CORPORATION COLLEGE ROAD, CHENNAI - 600 006.Government of Tamil Nadu First edition –
Electronic References (websites ... etc.)	http://ashipunov.info/shipunov/school/biol_154

Course Description Form

1. Course Name:

Organic Chemistry

2. Course Code:

Bio-1212

3. Semester/Year:

Semester 2

4. Description Preparation Date:

8/6/2023

5. Available Attendance Forms:

Weekly

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

175hours / 3 units

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

Name: Waseem Yousif Mohammed

Email: WaseemYousif@uodiyala.edu.iq

8. Course Objectives
Course Objectives

The students will acquire a broad understanding of the knowledge base in Organic Chemistry and its terminology or discourse. They will operate in a range of varied but predictable contexts that require the use of a specified range of techniques and information sources. The student will be required to identify principles and concepts underlying theoretical frameworks. The student will take responsibility for the nature and quality of outputs through defined problem classes.

9. Teaching and Learning Strategies
Strategy

Lessons of all units will be offered in an interactive lecture where student participation is mandatory either by forming small group discussion in class, exchange ideas and question one another. Where applicable students will be assigned problems to solve and encouraged to assess one another. Learning material will be supplied to students in class or uploaded on Blackboard learning management system. Students will also be regularly referred to relevant section of the prescribed text book. Most of the tutorial work will be done as self-study or with the assistance of a tutor. The teacher will facilitate lectures and laboratory experiment sessions with the assistance of a tutor or laboratory demonstrator. Assessment will be both formative and summative. Formative assessment refers to assessment whose purpose is to monitor student learning but will not be graded. Summative assessment refers to assessment given to students for grading such as theory tests, practical tests and examination.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		Hydrocarbons	Lecture ,demonstrations ,interactive discussion and	Introduction to computer, basic definition

				self-education	,interactive discussion and oral and written tests
2	4		IUPAC name of alkanes	=	=
3	4		Coupling of alkyl halides with organometallic compound	=	=
4	4		Coupling of alkyl halides with organometallic compound	=	=
5	4		Preparation of alkenes	=	=
6	4		Preparation of alkenes	=	=
7	4		Addition of halogen bromide. Peroxide effect	=	=
8	4		Oxidation of tributylborane gives butanol .	=	=
9	4		Free – radical polymerization of alkene	=	=
10	4		Mid exam	=	=
11	4		AROMATIC COMPOUND	=	=
12	4		Representation of benzene ring	=	=
13	4		Polysubstituted Benzenes	=	=
14	4		Determination of orientation:-	=	=
15	4		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)	The foundations of analytical chemistry, part one and two, by Dr. Moayad Al-Abajji
Main References (sources)	<ol style="list-style-type: none"> 1. Basset, J.et.al, Trans. By A Hadyana Pudjaatmaka dan L. Setiono, 1994, 2. Vogel, Quantitative Inorganic Analysis, 4th Ed., Jakarta: Penerbit Buku Kedokteran E G C. Svehla, G. & Vogel, A.L., Trans. By Setiono, 1985, 3. A Quantitative Inorganic Analysis, 3rd Ed., New York: John Wiley & Sons Inc. Skoog, D.A.& West, D.M., 1990 4. Analytical Chemistry, 5th Ed., Philadelphia: Saunders Golden Sunburst Series
Electronic References (websites ... etc.)	www.chemicalprocessing.com

Course Description Form

1. Course Name:					
Biostatistics					
2. Course Code:					
Bio-1213					
3. Semester/Year:					
Semester 2					
4. Description Preparation Date:					
8/6/2023					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
521hours / 2 units					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis. Prof. Dr. Anwar Nouruddin Imran					
Email: anwarmath@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		<ul style="list-style-type: none"> -To discuss and critic reports and articles applying biostatistics to epidemiology -To conduct preliminary/simple statistical analysis and to plan more sophisticated future statistical analyses -To work with scientific experts including biostatisticians, epidemiologists and public health professionals 			
9. Teaching and Learning Strategies					
Strategy		The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Concepts Fundamental	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	2		Presentation of Data	=	=
3	2		Measures of Central Tendency	=	=
4	2		Measures of Dispersion	=	=
5	2		The distributions, the binomial distribution, normal distribution	=	=

6	2		Statistical tests: T test, Z test, X test, F test	=	=
7	2		Analysis of variance, experiment, unit experimental, treatment, refined, degrees of freedom, total squares, mean Squares	=	=
8	2		Regression, correlation coefficient	=	=
9	2		SPSS statistical program introduction and definition	=	=
10	2		Introducing SPSS tools	=	=
11	2		Application analysis examples of laboratory experiments using the SPSS program	=	=
12	2		Methods of expressing the statistical results of biological experiments Variance	=	=
13	2		Analysis of Variance	=	=
14	2		Some Special Probability distributions	=	=
15	2		Final 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)	Hogg, R. V., McKean, J. W., & Craig, A. T. (2019). Introduction to mathematical statistics. Pearson.
Main References (sources)	Antonisamy, B., Premkumar, P. S., & Christopher, S. (2017). Principles and Practice of Biostatistics-E-book. Elsevier Health Sciences.
Electronic References (websites ... etc.)	https://www.sciencedirect.com/topics/medicine-and-dentistry/biostatistics

Course Description Form

1. Course Name:					
Safety and Biosecurity					
2. Course Code:					
Bio-1204					
3. Semester/Year:					
Semester 2					
4. Description Preparation Date:					
8/6/2023					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
75 hours / 2 units					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis. Prof. Dr. Ibtihal Hameed Mohsin					
Email: ibtihalhameed@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		<p>1- Protecting the human element from injuries resulting from the hazards of the work environment by preventing Exposure to accidents, injuries and occupational diseases.</p> <p>2- Preserving the essentials of the physical element represented in the facilities and the equipment they contain and equipment from damage and loss as a result of accidents.</p> <p>3- Providing and implementing all occupational health and safety requirements that ensure a safe environment.</p> <p>4- Verify risk prevention for the human and material elements the first lecturer</p> <p>5- Occupational safety and health aims as a scientific method to establish safety and tranquility in the hearts of workers while doing their work and reducing anxiety and panic attacks that they experience while they are They coexist by virtue of the necessities of life, with tools, materials, and machines in which danger lurks. which threatens their lives and under unsafe conditions that expose their lives from time to time to grave dangers</p>			
9. Teaching and Learning Strategies					
Strategy		The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Introduction to Biosafety	Lecture ,demonstrations ,interactive	Introduction to computer, basic

				discussion and self-education	definition ,interactive discussion and oral and written tests
2	2		Principles of Biosafety	=	=
3	2		Biosafety Level 2 (BSL)	=	=
4	2		Biosafety Level III (BSLIII)	=	=
5	2		Biosafety Level IV	=	=
6	2		Biosafety Equipments	=	=
7	2		Biosafety Terms	=	=
8	2		HEPA Filters/HEPA Filtration	=	=
9	2		HVAC system	=	=
10	2		Laminar Air Flow	=	=
11	2		Personal Protective Equipment (PPE)	=	=
12	2		primary containment device. (DSAT) □	=	=
13	2		Sterilization	=	=
14	2		Standard Operating Procedure (SOP)	=	=
15	2		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)	<ol style="list-style-type: none"> 1. <i>Biosafety and the environment: An introduction to the Cartagena Protocol on Biosafety (PDF)</i>. GE.03-01836/E. United Nations Environment Programme. في 15-02-2020 (PDF) الأصل ص. 8. مؤرشف من 2. Burnette, R. (2013). <i>Biosecurity: understanding, assessing, and preventing the threat</i>. John Wiley & Sons.
Main References (sources)	Zhou, D., Song, H., Wang, J., Li, Z., Xu, S., Ji, X., ... & Xu, J. (2019). Biosafety and biosecurity. <i>Journal of biosafety and biosecurity</i> , 1(1), 15-18.
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
Computer Science					
2. Course Code:					
Bio-1205					
3. Semester/Year:					
Semester 2					
4. Description Preparation Date:					
8/6/2023					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
100 hours / 3 units					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Iraq Ali Hussein Email: IraqAll@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		<p>This module aims to provide students with a grounding in the operation of a computer, and the interaction between the hardware, the operating system and the software.</p> <p>Students have gained an insight into basic concepts of computer science, working methods and research questions and have an appropriate perception of computer science. They can choose a field of study for themselves in Biology science</p>			
9. Teaching and Learning Strategies					
Strategy		The delivery of the module will include a range of teaching methods and learning styles. These include lectures, case studies, project work, presentations and tutorials; drawing on the student's experiential learning.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		Introduction to computers	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	4		Computer's components, Introduction to Windows	=	=
3	4		Introduction to Windows	=	=
4	4		The Internet and scientific research methods	=	=
5	4		Microsoft word, Parts of	=	=

			Microsoft Word		
6	4		Parts of Microsoft Word	=	=
7	4		Designing laboratory reports using Word	=	=
8	4		Mid exam	=	=
9	4		Introduction to Microsoft Excel	=	=
10	4		Explain the importance of Excel and its parts	=	=
11	4		Laboratory statistics using Excel	=	=
12	4		Designing laboratory reports using Excel, Microsoft Excel	=	=
13	4		Introduction to Microsoft PowerPoint	=	=
14	4		Explaining the parts and importance of PowerPoint Microsoft PowerPoint	=	=
15	4		Final 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)	Jukna, S. (2011). <i>Extremal combinatorics: with applications in computer science</i> (Vol. 571). Berlin: Springer.
Main References (sources)	Stallings, W., & Brown, L. (2015). <i>Computer security: principles and practice</i> . Pearson.
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
English Language					
2. Course Code:					
Bio-1206					
3. Semester/Year:					
Semester 2					
4. Description Preparation Date:					
8/6/2023					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
100 hours / 2 units					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis.Prof.Dr. Ansam Dawod Salman Email: ansamdawood@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		<ul style="list-style-type: none"> ▪ Introducing students to English grammar and the three main tenses (present, past and future) and its branches ▪ The four (simple, continuous, and complete, in addition to the continuous perfect). The course also aims to introduce the student ▪ Rules of how to speak English fluently. The course also aims to introduce the student to how to understand sentences Scientific expressions in the field of biology 			
9. Teaching and Learning Strategies					
Strategy		The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Grammar/ Articles (a, an, the) and sentences family	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	2		The Vast Influence of Ibn Sina, Pioneer of Medicine	=	=
3	2		Grammar: Using this, that, these, those	=	=
4	2		Climate Change	=	=
5	2		Dictation	=	=

6	2		Endangered Species	=	=
7	2		First exam	=	=
8	2		Writing about yourself in English	=	=
9	2		Prepositions of Time - at, in, on	=	=
10	2		Zaha Hadid	=	=
11	2		Translation: Homework (1): Paragraph in English converted in to Arabic	=	=
12	2		Synonyms in biology	=	=
13	2		Predicting the Future	=	=
14	2		The evolution of microbiology	=	=
15	2		Homework (2): Paragraph in Arabic converted in to English	=	=

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)	Li, N. (2015). <i>A book for every teacher: Teaching English language learners</i> . IAP.
Main References (sources)	McArthur, T., Lam-McArthur, J., & Fontaine, L. (Eds.). (2018). <i>Oxford companion to the English language</i> . Oxford University Press.
Electronic References (websites ... etc.)	Ur, P. (2012). <i>A course in English language teaching</i> . Cambridge University Press.

Course Description Form

1. Course Name:					
Biochemistry I					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Mandatory					
6. Number of Credit Hours (Total)/Number of Units (Total)					
30Hours					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis. Prof Waseeme Youssef Mohammed					
Email: dr.waseem.y@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives					
9. Teaching and Learning Strategies					
Strategy		Lecture method and use of the interactive whiteboard Explanation and clarification Asking students a set of thinking questions during lectures, such as what, how, when, and why for specific topics Giving students homework that requires self-explanation with causal methods and examples to be solved			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Introduction to biochemistry, cell chemistry		
2	2		Carbohydrates :monosaccharaides, disaccharides, polysaccharides		
3	2		Carbohydrates :monosaccharaides, disaccharides , polysaccharides		
4	2		Carbohydrates :monosaccharaides, disaccharides, polysaccharides		
5	2		Chemistry of fatty acids, other fatty compounds		
6	2		Chemistry of fatty acids, other fatty compounds		
7	2		Chemistry of fatty acids, other fatty compounds		
8	2		Nucleic acids, chemical structure, pyrimidic bases, purine bases, nucleotides, nucleosides		
9	2		Vitamins, co- enzyme		
10	2		Vitamins, co- enzyme		
11	2		Enzymes (structure, biological activity)		
12	2		Bioenergetics Energy-rich compounds, free energy		
13	2		Biological oxidation (oxidation reactions)		
14	2		Biological oxidation (oxidation reactions) Reduction reactions (mitochondria and electron transfer)		
15	2		Final 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)	Vasudevan, D. M., Sreekumari, S., & Vaidyanathan, K. (2013). Textbook of biochemistry for medical students. JP Medical Ltd.
Main References (sources)	Satyanarayana, U. (2013). Biochemistry. Elsevier Health Sciences.
Recommended Books and References (scientific journals, reports ... etc.)	
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
Biochemistry II					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Mandatory					
6. Number of Credit Hours (Total)/Number of Units (Total)					
30hours					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis. Prof Waseeme Youssef Mohammed					
Email:					
8. Course Objectives					
Course Objectives					
9. Teaching and Learning Strategies					
Strategy	Lecture method and use of the interactive whiteboard Explanation and clarification Asking students a set of thinking questions during lectures, such as what, how, when, and why for specific topics Giving students homework that requires self-explanation with causal methods and examples to be solved				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Carbohydrate metabolism (digestion, absorption, anaerobic oxidation, energy calculation)		
2	2		Lipid metabolism (digestion and absorption, acids and bile salts, oxidation and energy metabolism)		
3	2		Lipid metabolism (digestion and absorption, acids and bile salts, oxidation and energy metabolism)		
4	2		Lipid metabolism (digestion and absorption, acids and bile salts, oxidation and energy metabolism)		
5	2		Protein metabolism, osmotic balance		
6	2		Protein metabolism, osmotic balance		
7	2		Protein metabolism, osmotic balance , Digestion and absorption of proteins: chemical transformations of amino acids in living tissues, final products (urea) of the breakdown of amino acids in living tissues.		
8	2		Digestion and absorption of proteins: chemical transformations of amino acids in living tissues, final products (urea) of the breakdown of amino acids in living tissues.		

9	2		The interrelationship between the metabolism of different biological compounds		
10	2		The interrelationship between the metabolism of different biological compounds		
11	2		Hormones		
12	2		Biosynthesis of polysaccharides,		
13	2		photosynthesis and synthesis of disaccharides		
14	2		Exam		
15	2		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)	Michal, G., & Schomburg, D. (Eds.). (2012). Biochemical pathways: an atlas of biochemistry and molecular biology. John Wiley & Sons.
Main References (sources)	Satyanarayana, U. (2013). Biochemistry. Elsevier Health Sciences.
Recommended Books and References (scientific journals, reports ... etc.)	
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
Entomology					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Mandatory					
6. Number of Credit Hours (Total)/Number of Units (Total)					
30 hours					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis. Prof. Sanaa Nagem Abed					
Email: sanaa.abed@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives					
9. Teaching and Learning Strategies					
Strategy		Lecture, use of the blackboard and delivery. Demonstrations (using diagrams, pictures and educational films). Interactive discussion. Self-education.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Define entomology location of insects in the animal kingdom, arthropoda phylum their general characters .		
2	2		Classification of insects , general characters		
3	2		The importance of insects spread and success the reasons that help it the external structure of insects .		
4	2		Insect body areas : head ,thorax and abdomen .		
5	2		Internal anatomy of insect and metamorphosis .		
6	2		Digestive system nutrition.		
7	2		Circulatory system in insects.		
8	2		The excretory system		
9	2		Nervous system		
10	2		Respiratory system breathing in aquatic insects		
11	2		Reproductive system.		
12	2		Growth and reproduction in insects		
13	2		Embryonic growth		
14	2		Basics of insects control		
15	2		Final 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)	Richards, O. W., & Davies, R. G. (2013). Imms' general textbook of Entomology: Volume 2: Classification and biology. Springer Science & Business Media.
Main References (sources)	Gullan, P. J., & Cranston, P. S. (2014). The insects: an outline of entomology. John Wiley & Sons.
Recommended Books and References (scientific journals, reports ... etc.)	
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
Invertebrates					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Mandatory					
6. Number of Credit Hours (Total)/Number of Units (Total)					
30 Hours					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis. Prof. Asraa Dawood Farhan					
Email: asraa@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives					
9. Teaching and Learning Strategies					
Strategy		Lecture, use of the blackboard and delivery. Demonstrations (using diagrams, pictures and educational films). Interactive discussion. Self-education.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Invertebrate group , an overview of the principles of taxonomy, the importance of invertebrates ,benefits and harms.		
2	2		Major division , division protozoans features and classification of it .		
3	2		Sarcodina classification general characters.		
4	2		Mastigophora , cilitata classification and general characters.		
5	2		Porifera classification and general characters.		
6	2		Cnidaria classification and general characters.		
7	2		Platyhelminthes classification and general characters.		
8	2		Aschelminthes classification and general characters.		
9	2		Annelida classification and general characters.		
10	2		Arthropoda classification and general characters, trilobites.		
11	2		Crustacea chelicerata		
12	2		Mollusca classification and general characters.		
13	2		Dentalium , Anodonta , Sepia , Octopu , Nautilus.		

14	2		Echinodermata classification and general characters.		
15	2		Chordata classification and general characters.		

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)	Kotpal, R. L. (2012). Modern text book of Zoology: Invertebrates. Rastogi Publications.
Main References (sources)	Lacey, L. A. (Ed.). (2012). Manual of techniques in invertebrate pathology. Academic press.
Recommended Books and References (scientific journals, reports ... etc.)	
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
Microbiology I					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Mandatory					
6. Number of Credit Hours (Total)/Number of Units (Total)					
30 hours					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Prof. Dr. Zainab Mohammed Nsaif					
Email: dr.zainab@ uodiyala.edu.iq					
8. Course Objectives					
Course Objectives					
9. Teaching and Learning Strategies					
Strategy		Conducting fun scientific competitions (individual or team). Organizing lectures prepared by students. Forming volunteer work groups. Scientific trips.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Introduction and historical overview of the development of microbiology.		
2	2		The location of microbiology in the world of biology and evolution classification.		
3	2		Characteristics of microorganisms and their nutritional requirements.		
4	2		Types of microorganisms, bacteria ,fungi , parasites , bacteriophage and algae .		
5	2		Types of microorganisms, bacteria, fungi, parasites , bacteriophage and algae .		
6	2		Types of microorganisms, bacteria ,fungi , parasites , bacteriophage and algae .		
7	2		Prokaryotic characteristics and eukaryotic comparison.		
8	2		Bacterial groups and their characteristics		
9	2		External structure of bacteria		
10	2		Internal structure of bacteria		
11	2		Nutrition of bacteria		
12	2		Bacterial growth , reproduction and growth estimation		
13	2		Bacterial growth , reproduction and growth estimation		
14	2		Control of microorganism by using physical and chemical methods and antibiotics .		
15	2		Final 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)	Kumar, S. (2012). Textbook of microbiology. JP Medical Ltd.
Main References (sources)	Tille, P. (2015). Bailey & Scott's diagnostic microbiology-E-Book. Elsevier Health Sciences.
Recommended Books and References (scientific journals, reports ... etc.)	
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
Microbiology II					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Mandatory					
6. Number of Credit Hours (Total)/Number of Units (Total)					
30 hours					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Prof. Dr. Zainab Mohammed Nsaif					
Email: dr.zainab@ uodiyala.edu.iq					
8. Course Objectives					
Course Objectives					
9. Teaching and Learning Strategies					
Strategy	Lecture method and use of the interactive whiteboard Explanation and clarification Asking students a set of thinking questions during lectures, such as what, how, when, and why for specific topics Giving students homework that requires self-explanation with causal methods and examples to be solved				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Controlling microorganisms using physical, chemical, and antibiotic methods		
2	2		Controlling microorganisms using physical, chemical, and antibiotic methods		
3	2		Exam		
4	2		Immunity		
5	2		Immunity		
6	2		Immunity		
7	2		Genetics in bacteria		
8	2		Pathogenic microorganisms		
9	2		Food microorganisms		
10	2		Food microorganisms		
11	2		Industrial microbiology and biotechnology		
12	2		Soil microorganisms		
13	2		Soil microorganisms		
14	2		Microorganisms in air and water		
15	2		Final 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)	Parija, S. C. (2023). Textbook of microbiology and immunology. Springer.
Main References (sources)	Mitchell, R., & Gu, J. D. (Eds.). (2010). Environmental microbiology. John Wiley & Sons.
Recommended Books and References (scientific journals, reports ... etc.)	
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
Parasitology					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Mandatory					
6. Number of Credit Hours (Total)/Number of Units (Total)					
30 Hours					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis. Prof. Asraa Dawood Farhan					
Email: asraa@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives					
9. Teaching and Learning Strategies					
Strategy		Lecture, use of the blackboard and delivery. Demonstrations (using diagrams , pictures and educational films). Interactive discussion. Self-education .			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		A general introduction I parasitology and parasitism types of parasites types of hosts and effect of parasites on hosts.		
2	2		Sarcodina , ciliates, flagellate.		
3	2		Haemodlagellates		
4	2		Leshmania and Sporozoa		
5	2		Class: Treatoda , Fasciola hepatica		
6	2		Schistosoma		
7	2		Cestoda		
8	2		Echinococcusgranulo sus DiplylidiumCaninum		
9	2		Trichuristrichiura		
10	2		Ascarislumbricodes		
11	2		Spin headed worm		
12	2		Medicinal insects like sand fly coleopteran		
13	2		Hemiptera		
14	2		Ticks and mites include scabies mites hard ticks and spiders.		
15	2		Different diagnostic methods.		
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)	Cox, F. E. (Ed.). (2009). Modern parasitology: a textbook of parasitology. John Wiley & Sons.
Main References (sources)	Loker, E. S., & Hofkin, B. V. (2022). Parasitology: a conceptual approach. CRC Press.
Recommended Books and References (scientific journals, reports ... etc.)	
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
Plant Anatomy					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Mandatory					
6. Number of Credit Hours (Total)/Number of Units (Total)					
30 hours					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Prof. Dr. Khazal Dabeh Wadi					
Email: dr.khazal@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		Introducing the student to the internal structure of the plant body by dissecting its various organs , studying the type of cells that make them up and the function of each type . this science in fact the study of the internal morphology of plants			
9. Teaching and Learning Strategies					
Strategy		Lecture, use of the blackboard and delivery. Demonstrations (using diagrams , pictures and educational films). Interactive discussion. Self-education .			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Introducing the student to the plant body and its internal structure in terms of the component of its organs , including tissue , cell and their functions	Plants anatomy , its importance and goals: identifying the primary plant body and its growth and the secondary growth .		
2	2	Introducing the student to the types of cells how to distinguish between them , and the function of each type of cell	Plant cell – its living and nonliving components		
3	2		Cell wall , pits and their types		
4	2		Meristematic tissues and theories of the emergence of developing peaks		
5	2		Permanent tissue and periderms		
6	2		Parenchymal tissue and collenchyma and sclerenchyma		
7	2		Xylem and phloem		
8	2		Secretory cells fruit texture		
9	2		Stomatal complex their types and trichomes		
10	2		Internal structure of roots , stem and leaf		
11	2		Secondary thickening of the plant		
12	2		Types of xylem and the differences between them types		
13	2		Vascular cambium		

14	2		Brydium - cork cambium – bark prederm wounds		
15	2		Seasonal 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)	Crang, R., Lyons-Sobaski, S., & Wise, R. (2018). Plant anatomy: a concept-based approach to the structure of seed plants. Springer.
Main References (sources)	Beck, C. B. (2010). An introduction to plant structure and development: plant anatomy for the twenty-first century. Cambridge University Press.
Recommended Books and References (scientific journals, reports ... etc.)	
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
Plant Grouping					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Mandatory					
6. Number of Credit Hours (Total)/Number of Units (Total)					
30 Hours					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis. Prof. Khalid Dheyaa Abdul Wahiid					
Email: chechanikd75@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives				Identify the foundations and systems of plants classification environments and types of algae archaea and gymnosperms.	
9. Teaching and Learning Strategies					
Strategy		Lecture , use of the blackboard and delivery. Demonstrations(using diagrams , pictures and educational films). Interactive discussion . Self-education .			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Introduction to plant groups and the basis of it classification		
2	2		Blue – green algae		
3	2		Green algae general qualities, variety vegetative forms ,reproduction .		
4	2		Basis of classification ,shapes nonocellular and colonial.		
5	2		Filamentous form of green algae.		
6	2		Charophyceae , Euglenoidea .		
7	2		Ditoms		
8	2		Phaeophyceae types and life cycle.		
9	2		Rhodophyta		
10	2		Tracheophyta		
11	2		Arthropphyta		
12	2		Pteridophyta		
13	2		Pteridophyta		
14	2		Gymnospermae		
15	2		Final 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)	Sheath, R. G., & Wehr, J. D. (2015). Introduction to the freshwater algae. In <i>Freshwater Algae of North America</i> (pp. 1-11). Academic Press.
Main References (sources)	Reddy, S. M. (2001). <i>University botany I:(algae, fungi, bryophyta and pteridophyta)</i> (Vol. 1). New Age International.
Recommended Books and References (scientific journals, reports ... etc.)	
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
Plants Taxonomy					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Mandatory					
6. Number of Credit Hours (Total)/Number of Units (Total)					
30Hours					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Prof. Dr. Khazal Dabeh Wadi					
Email: dr.khazal@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		Teaching the student the basics of plant classification, methods of diagnosing and naming plants (giving a scientific name), and classifying them into their own taxonomic ranks according to a reliable classification system that reflects their evolutionary relationships.			
9. Teaching and Learning Strategies					
Strategy		Lecture , use of the blackboard and delivery. Demonstrations(using diagrams , pictures and educational films). Interactive discussion . Self-education .			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Plant classification, its importance, maps and goals		
2	2		General botanical terms		
3	2		Fields of taxonomy and classification systems		
4	2		Phenotypic study of roots. Phenotypic study of stems and leaves		
5	2		Phenotypic study of the flower and its conventions		
6	2		Androecium and Gynoecium		
7	2		Inflorescence		
8	2		Fruits and seeds		
9	2		Pollination, its importance, types and mediators		
10	2		The evolutionary importance of reproductive systems		
11	2		Taxonomic ranks and typical specimens		
12	2		Herbarium, botanical gardens and Iraqi plants		
13	2		Cellular classification		
14	2		Chemical classification		
15	2		Final 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)	Singh, M. P., Nayar, M. P., & Roy, R. P. (1994). Textbook of forest taxonomy. Anmol Publications PVT Ltd..
Main References (sources)	Simpson, M. G. (2019). Plant systematics. Academic press.
Recommended Books and References (scientific journals, reports ... etc.)	
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
Animal Physiology					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
2024/4/1					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
60 hour/ 3 unit					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis.Prof. Dr. Anwar Abdulameer Email: anwarabdulameer@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		<ol style="list-style-type: none"> 1. To define principles of physiology . 2. To understand concept of homeostasis 3. This course deals with the major mechanism to maintain the internal environment 4. This is the basic subject for all organs function . 5. To understand mechanism of nervous system 6. To understand mechanism of hormones action 			
9. Teaching and Learning Strategies					
Strategy		Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		Introduction – to physiology and homeostasis	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	4		Basics of feedback mechanism	=	=
3	4		Introduction to nervous system physiology	=	=
4	4		Movement of sodium and potassium ions across membrane in stimulated and unstimulated state	=	=
5	4		Membrane potential and current of nerve impulse velocity	=	=

6	4		Explain elements of synapses , types of synapse	=	=
7	4		First test	=	=
8	4		Neurotransmitter and introduction to hormones	=	=
9	4		Mechanism of hormones action , pituitary gland	=	=
10	4		Neurohypophyseal and adenoypophyseal hormones	=	=
11	4		Thyroid gland , hormone production and function	=	=
12	4		Parathyroid hormone , adrenal hormones and pineal body production of melatonin	=	=
13	4		Introduction to digestive system physiology , major salivary gland secretion anf function	=	=
14	4		Physiology of digestive , major gastric gland	=	=
15	4		Gastric juice secretion , production of HCL	=	=

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)	Tortora, G. J., & Derrickson, B. H. (2011). Principles of anatomy and physiology. 2008. <i>Hoboken: John Wiley & Sons Google Scholar.</i>
Main References (sources)	Khurana, I. (2018). Concise Textbook of Human Physiology. Elsevier Health Sciences.-
Recommended Books and References (scientific journals, reports ... etc.)	Pocock, G., Richards, C. D., & Richards, D. A. (2013). <i>Human physiology.</i> Oxford University Press, USA.-

Course Description Form

1. Course Name:					
Cell Biology					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
2023/9/1					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
60 hour/ 3 unit					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Prof. Dr. Ibrahim Hadi Mohammed e-mail					
Email: dr.ibraheemhadi@gmail.com					
8. Course Objectives					
Course Objectives		Introducing the student to all types of small cells that are seen with a microscope, to large cells such as eggs that are seen with the naked eye, and knowing the chemical components and vital functions of the internal components of cells. Introduce the student to the types of animal and plant cells, as well as bacteria and viruses, which are considered cells as well.			
9. Teaching and Learning Strategies					
Strategy		Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		Introduction to the study of the cell	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	4		eukaryotic cell	=	=
3	4		cell chemistry	=	=
4	4		Structure and function of the cell wall	=	=
5	4		Movement of materials across membranes	=	=
6	4		Cytoplasm	=	=
7	4		Endoplasmic reticulum	=	=
8	4		Mitochondria	=	=
9	4		Plastids	=	=
10	4		protein industry	=	=
11	4		Control of genetic change	=	=
12	4		Nucleus	=	=
13	4		Nucleolus	=	=
14	4		Chromosomes	=	=
15	4		cell inheritance	=	=
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)	Jeff Hardin and Gregory Bertoni .(2016) Becker´s world of the cell.9th edition .Pearson Alberts B., Johnson A., Lewis J., Raff M., Roberts K. and Walter P. (2002). Molecular biology of the cell .4th edition
Main References (sources)	
Recommended Books and References (scientific journals,	Kendrick, Karolyn (1 January 2010). Chemistry in Medicine. Benchmark Education Company. p. 26
Electronic References (websites ... etc.)	Madigan MT, Martinko JM & Parker J (2000) Brock's Biology of Microorganisms, 9th edn. Englewood Cliffs, NJ: Prentice Hall.

Course Description Form

1. Course Name:					
Ecology					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
2024/4/1					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
60 hour/ 3 unit					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Prof. Dr. Munther Hamza Rathi					
Email: Prof.dr.rathi@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		Learning About the basic principles of ecosystem			
9. Teaching and Learning Strategies					
Strategy		1- Explanation using various modern presentation tools - the method of lecture and the use of the interactive whiteboard 2-Providing students with the basics and additional topics related to evolutionary computation and its systems 3- Forming discussion groups during lectures to discuss modern systems that require thinking and analysis 4- Ask students a set of thinking questions during the lectures such as what, how, when and why for specific topics 5- Giving students homework that requires self-explanations in causal ways.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		ECOLOGY – Introduction and terms	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	4		Branches of Ecology	=	=
3	4		BASIC PRINCIPLES OF ECOSYSTEM	=	=
4	4		Functions of an Ecosystem:	=	=
5	4		Biogeochemical Cycles- Gaseous cycles	=	=
6	4		Biogeochemical Cycles- sedimentary cycle	=	=
7	4		Eutrophication	=	=
8	4		Primary productivity	=	=
9	4		Environmental Factors Affecting the Productivity in Ecosystem	=	=
10	4		Biological interrelationships	=	=

11	4		Limiting factors & tolerance levels	=	=
12	4		Liebig's law of minimum	=	=
13	4		Shelford's law of tolerance	=	=
14	4		Some types of limiting factors:	=	=
15	4		Population	=	=

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)	Agarwal, S. K. (2008). <i>Fundamentals of ecology</i> . APH Publishing.
Main References (sources)	
Recommended Books and References (scientific journals, reports ... etc.)	Elements of Ecology, Smith&Smith,1998, Benjamin Publishing, USA. • Environmental Ecology, Maier et al, 2008, 2nd Ed. Academic Press, ISBN: 978-0123705198. New York
Electronic References (websites ... etc.)	www. Ecologysci.com

Course Description Form

1. Course Name:					
Genetics					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
2024/4/1					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
30 hour/ 3 unit					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Prof. Dr. Ibrahim Hadi Mohammed					
Email: dr.ibraheemhadi@gmail.com					
8. Course Objectives					
Course Objectives		A science that studies the ways in which physical and moral characteristics are transmitted to children from parents through genes (which are segments of genetic material "DNA"). Inherited characteristics include height, skin color, hair and eyes, susceptibility to certain diseases, mental abilities and some talents.			
9. Teaching and Learning Strategies					
Strategy		Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		Introduction to the study of the genetics	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	4		Study of Mendel's laws about peas	=	=
3	4		Mendelian laws	=	=
4	4		sex-related traits	=	=
5	4		Quantitative genetics	=	=
6	4		EXAM	=	=
7	4		Cytoplasmic inheritance	=	=
8	4		Population genetics	=	=
9	4		Chromosomal inheritance	=	=
10	4		Genetic diseases	=	=
11	4		Genetics and sex	=	=

12	4		Genetic inheritance	=	=
13	4		Genetic Disease	=	=
14	4		Chromosomal diseases	=	=
15	4		Blood types and chronic diseases	=	=

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)	Clément, Pierre, and Jérémy Castéra. "Multiple representations of human genetics in biology textbooks." <i>Multiple representations in biological education</i> . Dordrecht: Springer Netherlands, 2012. 147-163..
Main References (sources)	-Albuquerque, P. M., de Almeida, A. M. R., & El-Hani, N. C. (2008). Gene Concepts in Higher Education Cell and Molecular Biology Textbooks. <i>Science Education International</i> , 19(2), 219-234.
Recommended Books and References (scientific journals,	Viville, S., & Sermon, K. D. (Eds.). (2022). <i>Textbook of human reproductive genetics</i> . Cambridge University Press.
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
Histology					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
2024/4/1					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
60 hour/ 3 unit					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis.Prof. Dr. Anwar Abdulameer					
Email: anwarabdulameer@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		<ul style="list-style-type: none"> 1-To define what is tissue , primary tissues and location of each type of tissue in different organs. 2-To understand function of each organ in human body after study of organs tissues 3-This course deals with concept of primary tissues , organs as well as systems 4-This course is necessary to study muscles, epithelia, connective and nerves. 5-To understand embryonic development of primary tissue. 6-To perform mesh and Nodal analysis. 			
9. Teaching and Learning Strategies					
Strategy		Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		Introduction to histology , epithelia and classification of epithelial tissue	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	4		Development of glands , classification of glands , location and description of each types of glands	=	=
3	4		Introduction to connective tissue and essential elements of connective tissue	=	=
4	4		Classification of loose and dense connective tissue , histology of each type of loose and dense connective tissue	=	=
5	4		Introduction to skeletal connective tissue , cartilage and bone	=	=

6	4		Hemopoietic tissue and hemopoiesis , types of bone marrow	=	=
7	4		Types of cartilages , development and growth of cartilage	=	=
8	4		Types of bone , description histology of bone , types of cells in the bone , periosteum	=	=
9	4		First test	=	=
10	4		Histology of muscles , skeletal	=	=
11	4		Histology of muscle , cardiac and smooth muscles	=	=
12	4		introduction to histology of nervous system , types of neurons , differences between axon and dendrites	=	=
13	4		Histology of nervous system	=	=
14	4		Introduction to study histology of circulatory system , veins and artery in addition to heart and valves	=	=
15	4		Second test	=	=

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)	Eroschenko, V. P., & Di Fiore, M. S. (2013). DiFiore's atlas of histology with functional correlations. Lippincott Williams & Wilkins.
Main References (sources)	-Kierszenbaum, A. L., & Tres, L. (2015). <i>Histology and Cell Biology: an introduction to pathology E-Book</i> . Elsevier Health Sciences.
Recommended Books and References (scientific journals,	Chiego Jr, D. J. (2013). <i>Essentials of Oral Histology and Embryology-E-Book: A Clinical Approach</i> . Elsevier Health Sciences.
Electronic References (websites ... etc.)	Meyer, D. B. (1985). <i>Laboratory Guide for Human Histology</i> . Wayne State University Press.

Course Description Form

1. Course Name:					
Immunology					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
2024/4/1					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
30 hour/ 3 unit					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis.Prof. Dr.Ibtihal Hameed Mohsin					
Email: ibtihalhameed@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		<ol style="list-style-type: none"> 1. Learn about the history, fields and development of immunology 2. As well as knowing the types of immunity and what are the factors that determine immunity 3. As well as studying immune cells, how these cells work, identifying lymphoid organs, and what are the types of immune response 4. And identifying antibodies and antigens and their interaction 7a and identifying the types of allergic reactions and their harms 5. As well as knowing the role of the histocompatibility complex and its importance from the immunological point of view 6. Learn about the most important immune interactions between cells and the role of chemicals produced by some immune cells. 			
9. Teaching and Learning Strategies					
Strategy		Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		Definition of Immunity and Immune system. Historical Background of Immunolog	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	4		Innate host defenses A. Anatomical barriers against infections: B. Humoral barriers against infections: C. Cellular barriers against infections: Characteristics of non-specific (Innate) immunity	=	=
3	4		Granulocytes:-polymorphonuclear cells Non- granulated cells Monocyte Lymphocytes	=	=
4	4		Characteristics of Acquired Immunity	=	=

			Classification of adaptive immunity		
5	4		Lymph nodes Spleen	=	=
6	4		Mechanisms of IR Primary IR Secondary IR	=	=
7	4		Properties of Immunogen Haptens Adjuvant	=	=
8	4		Structure of Ab Classes of Ab	=	=
9	4		Consequences of Antigen-Antibody Binding Properties of Ag-Ab reaction	=	=
10	4		Pathways of Complement activation	=	=
11	4		Organ specific autoimmune diseases Non -Organ specific autoimmune diseases	=	=
12	4		Central and peripheral tolerance	=	=
13	4		Types of Immune-deficiency Factors cause immune deficiency	=	=
14	4		Immune cell with antitumor activity Tumor associated antigens Immunotherapy	=	=
15	4		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)	Doan, Thao, et al. <i>Immunology</i> . Lippincott Williams & Wilkins, 2012.
Main References (sources)	Buxton, B. A., Jensen, L. A., & Gregg, R. K. (2009). <i>Lippincott's illustrated Q&A review of microbiology and immunology</i> . Lippincott Williams & Wilkins.
Recommended Books and References (scientific journals, reports ... etc.)	Rich, R. R., Fleisher, T. A., Shearer, W. T., Schroeder Jr, H. W., Frew, A. J., & Weyand, C. M. (2012). <i>Clinical immunology e-book: principles and practice</i> . Elsevier Health Sciences.
Electronic References (websites ... etc.)	Journal of immunology Journal of clinical immunology American journal of immunology European journal of cellular immunology

Course Description Form

1. Course Name:					
Microbial Physiology					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
2024/4/1					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
60 hour/ 3 unit					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Assis.Prof. Dr. Izdehar Mohammed jasim					
Email: Izdehar@uodiyala.edu.iq.					
8. Course Objectives					
Course Objectives		A. Introduction to physiology B. Studying the internal structure and extracellular structure of bacteria C To understand the Growth of bacteria and groth phases D. Studying the energy production E. This course deals with the basic concept of metabolism.			
9. Teaching and Learning Strategies					
Strategy		-Lecture method, use of the interactive whiteboard, presentation, and use of explanatory films - explanation and clarification - Asking students a set of questions about microbial physiology during the lectures, such as what, how, when and why for specific topics.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		Introduction : Microbiology And Microbial Physiology Microbial Cell Morphology And Fine Structure,	Lecture ,Demonstrations ,Interactive Discussion And Self-Education	Introduction To Computer, Basic Definition ,Interactive Discussion And Oral And Written Tests
2	4		The Cell Wall,Gram Positive And Gram Negative Bacteria	=	=
3	4		Other Extracellular Structures	=	=
4	4		Microbial Nutrition	=	=
5	4		Up Take Of Nutrients By The Microbial Cell	=	=
6	4		Environmental Factors Affecting Growth	=	=
7	4		Mid-Term Exam	=	=
8	4		Growth Of Bacteria	=	=
9	4		Types Of Microbial Culture	=	=
10	4		Energy Production And Metabolism	=	=
11	4			=	=
12	4		Aerobic Respiration	=	=
13	4		Fermentation	=	=
14	4		Glycolysis Cycle	=	=

15	4		The Citric Acid Cycle (Krebs Cycle Or Tricarboxlic Acid Cycle)	=	=
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)		Watson, D. Microbiology and Microbial Physiology. White Word Publications, New York, USA. 2018.			
Main References (sources)		Kim, B.H. and Gadd G.M. Bacterial Physiology and Metabolism. Cambridge University Press, New York, USA. 2008. Moat, A.G. J.; Foster, W. and Spector M.P. Microbial Physiology, 4th Edition, John Wiley & Sons, Inc., Publications, New York, USA. 2002. Watson, D. Microbiology and Microbial Physiology. White Word			
Recommended Books and References (scientific journals, reports ... etc.)		Publications, New York, USA. 2018. Chapters <ul style="list-style-type: none"> • Latest published • Chapters in press • Top cited • Most downloaded • Most popular <hr/> Book chapterAbstract only Chapter One - Biosynthesis and function of microbial methylmenaquinones Dennis Wilkens, Jörg Simon 2023 Book chapterAbstract only Chapter Two - Molecular discoveries in microbial DMSP synthesis			
Electronic References (websites ... etc.)		Founded in 2003 as Journal of Molecular Microbiology and Biotechnology, continued 2020 as Microbial Physiology .			

Course Description Form

1. Course Name:					
Plant Physiology					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
2024/4/1					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
60 hour/ 3 unit					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Dr. Khalid Dheyaa Abdulwahid Email: chechanikd75@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		<ol style="list-style-type: none"> 1. Recognizing the importance of water for plants and studying water relations. 2. Identify the water potential and important theories for movement, absorption and transmission of water. 3. Studying photosynthesis and identifying light and dark reactions in C3 plants, C4-plants, and CAM-plants. 4. Study respiration in plants and identify the types of respiration, respiration coefficient and respiration mechanism. 5. Identifying the plant hormones Auxins, Gibberellins, Cytokinins, abscisic acid and ethylene, and the importance of these hormones. 6. Granting the student a bachelor's degree in the theoretical and practical aspects. 			
9. Teaching and Learning Strategies					
Strategy		Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		Introduction: Definition of plant physiology- Solutions and Colloidal Systems.	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	4		Plant-Water Relations: Chemical composition of water- Physical properties of water.	=	=
3	4		Plant-Water Relations: Physiological importance of water in plant life-Diffusion- Permeability.	=	=
4	4		Plant-Water Relations: Imbibition-Osmosis- Influencing factors in osmotic pressure.	=	=
5	4		Plant-Water Relations: The plant cell as an osmotic	=	=

			system- Plasmolysis- Water in plant cells.		
6	4		Transpiration: Transpiration benefits-Transpiration types-Factors affecting transpiration rates.	=	=
7	4		Transpiration: Stomata, their number and distribution- The mechanism of action of stomata.	=	=
8	4		Absorption of Water in Plants: Passive and active absorption –Symplast and apoplast pathways.	=	=
9	4		Absorption of Water in Plants: Theories of water absorption-Factors affecting water absorption	=	=
10	4		Translocation of water: important theories that explain the mechanism of water rise in the plant.	=	=
11	4		Photosynthesis: Photosynthetic pigments- Light reactions-Enzymatic reactions-C ₃ - plants.	=	=
12	4		Photosynthesis: C ₄ - plants- CAM-plants- Photorespiration-Factors affecting photosynthesis.	=	=
13	4		Respiration in plant: Respiration coefficient- Glycolysis- Krebs cycle- Electron transport systems.	=	=
14	4		Plant hormones: Growth regulators- Growth stimulants-Auxins- Gibberellins-Cytokinins.	=	=
15	4		Plant hormones: Growth inhibitors- Abscisic acid ABA- Ethylene.	=	=

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)	Plant Physiology -Theory and Applications (2020).S. L. Kochhar, University of Delhi, Sukhbir Kaur Gujral, University of Delhi,2nd edition.
Main References (sources)	Taiz ,L. and E. Zeiger.2002. Plant Physiology, 3rd ed.Sinauer Associates.
Recommended Books and References (scientific journals,	https://www.frontiersin.org/journals/plant-science/sections/plant-physiology

Course Description Form

1. Course Name:					
Pollution					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
2024/4/1					
5. Available Attendance Forms:					
weekly					
6. Number of Credit Hours (Total)/Number of Units (Total)					
60 hour/ 3 unit					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Prof. Dr. Munther Hamza Rathi					
Email: Prof.dr.rathi@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		Learning About the basic principles of pollution			
9. Teaching and Learning Strategies					
Strategy		1- Explanation using various modern presentation tools - the method of lecture and the use of the interactive whiteboard 2-Providing students with the basics and additional topics related to evolutionary computation and its systems 3- Forming discussion groups during lectures to discuss modern systems that require thinking and analysis 4- Ask students a set of thinking questions during the lectures such as what, how, when and why for specific topics 5- Giving students homework that requires self-explanations in causal ways.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		Definition of Ecological pollution, Some terms of environmental pollution	Lecture ,demonstrations ,interactive discussion and self-education	Introduction to computer, basic definition ,interactive discussion and oral and written tests
2	4		The nature of the pollutants	=	=
3	4		Biological concentration and Discrimination	=	=
4	4		The effects of environmental pollution	=	=
5	4		Sources of pollution	=	=
6	4		Air pollution	=	=
7	4		Air pollution	=	=
8	4		Smog (Smoke + Fog = Smog)	=	=
9	4		Water pollution	=	=
10	4		Water pollution	=	=
11	4		Water pollution	=	=
12	4		Global air pollutants	=	=
13	4		Ozone	=	=
14	4		Radiation Pollution	=	=

15	4		Noise pollution , Food contamination	=	=
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)		Clément, Pierre, and Jérémy Castéra. "Multiple representations of human genetics in biology textbooks." <i>Multiple representations in biological education</i> . Dordrecht: Springer Netherlands, 2012. 147-163..			
Main References (sources)		-Albuquerque, P. M., de Almeida, A. M. R., & El-Hani, N. C. (2008). Gene Concepts in Higher Education Cell and Molecular Biology Textbooks. <i>Science Education International</i> , 19(2), 219-234.			
Recommended Books and References (scientific journals,		Viville, S., & Sermon, K. D. (Eds.). (2022). <i>Textbook of human reproductive genetics</i> . Cambridge University Press.			
Electronic References (websites ... etc.)					

Course Description Form

1. Course Name:					
Food Microbiology					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Obligatory					
6. Number of Credit Hours (Total)/Number of Units (Total) :					
30					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Dr. Abbas Yaseen Hasan Email: abbasyaseen@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives			<ul style="list-style-type: none"> ▪ Developing student's ability to recall what he learned about food microorganisms. ▪ Improving comprehension and developing the ability to interpret. ▪ Develop application capabilities. ▪ Gives the student the ability to analyze. ▪ Develop student's ability to integrate ideas into synthesis. ▪ Evaluation by giving judgment on the value of the article. 		
9. Teaching and Learning Strategies					
Strategy		Evaluation modalities Practical tests 2- Theoretical tests 3- Reports and studies 4- Daily exams with self-solving questions 5- Grades determined by homework			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Introduction in Food Microbiology		Quizzes Assignments Projects Midterm Exam Final Exam
2	2		Important Microorganisms in food		
3	2		Important Bacterial Groups in Foods		
4	2		Important Mold Genera		
5	2		Important Yeast Genera		
6	2		Intrinsic and Extrinsic Parameters of Foods That Affect Microbial Growth		
7	2		Microbial spoilage of foods		
8	2		Effect of freezing on food microorganisms		
9	2		High-Temperature Food Preservation		
10	2		Low-Heat Process or Pasteurization		
11	2		Radiation Preservation of Foods		

12	2		Preservation of Foods by Drying		
13	2		Food Preservation with antimicrobial preservatives		
14	2		Control of Microorganisms in Milk		
15	2		Ideal antimicrobial preservatives of food		

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)	Ray, B., & Bhunia, A. (2007). Fundamental food microbiology. CRC press
Main References (sources)	Modern Food Microbiology. (2008).7th Edition. James ,M. Jay ,Martin , J. Loessner , David ,A. Golden.
Recommended Books and References (scientific journals, reports ... etc.)	Banwart, G. (2012). Basic food microbiology. Springer Science & Business Media
Electronic References (websites ... etc.)	https://www.routledge.com/Fundamental-Food-Microbiology/Ray-Bhunip/book/9781466564435 . U.S.A.

Course Description Form

1. Course Name:					
Comparative Anatomy					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Is obligatory					
6. Number of Credit Hours (Total)/Number of Units (Total) :					
30					
7. Course Administrator's Name (mention all, if more than one name)					
Name : Assistant Professor Mayada nazar jabbar Email: mayyadanazar@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives			<ul style="list-style-type: none"> ▪ Knowledge of the emergence and development of body systems in different chordates with a comparison with a structural and functional orientation. ▪ Study of living beings belonging to the chordates ▪ classify these organisms into primary chorders and vertebrates, ▪ Identify the composition and specifications of these organisms ▪ Comparison between these organisms anatomically 		
9. Teaching and Learning Strategies					
Strategy		<ul style="list-style-type: none"> • Dialogue and discussion Brainstorming –Self-learning • In Using Morphological Traits as Taxonomic Keys to Define Animals of the Animal Kingdom • Cooperative Learning • Home Quizzes Duties • Interactive lecture on explaining how the morphological and anatomical structure of chordates fit into their environment and way of living. 			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		General Introduction about chordates		Quizzes Assignments Projects Midterm Exam Final Exam
2	2		Classification of the phylum chordates 1		
3	2		Classification of chords (2)		
4	2		Excretory system in different chords		
5	2		Reproductive system in different chords		
6	2		Comparison of reproductive organs		
7	2		Chordates morphology		
8	2		Cutaneous system in chordates		
9	2		Leathern Derivatives / Comparison		
10	2		Digestive system in different chordates		
11	2		Gastroenterology / Digestive Accessories		
12	2		Skeletal system in chordates		
13	2		Axial structure in chordates		
14	2		The terminal structure of the chordates		

15	2		Circulatory system in chordates		
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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)	Pandey, B. N., & Mathur, V. (2018). Biology of chordates. PHI Learning Pvt. Ltd
Main References (sources)	Comparative anatomy, function, evolution. Kardong, K. V. (2012).
Recommended Books and References (scientific journals, reports ... etc.)	Verma, P. S. (2010). Chordate zoology. S. Chand Publishing
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:					
Industrial Microbiology					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Is obligatory					
6. Number of Credit Hours (Total)/Number of Units (Total) :					
30					
7. Course Administrator's Name (mention all, if more than one name)					
Name : Dr. Abbas Yaseen Hasan Email: abbasyaseen@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives			<ul style="list-style-type: none"> To obtain basic information in industrial microbiology. Providing a broad base of knowledge and understanding of industrial microbiology. Develop the skills of obtaining information. Encourage and train the student on how to deal with scientific facts. Encouraging students to conclude and interpret results and how to present and discuss them. Evaluation by giving judgment on the value of the article. 		
9. Teaching and Learning Strategies					
Strategy		Evaluation modalities 1- Practical tests 2- Theoretical tests 3- Reports and studies 4- Daily exams with self-solving questions 5- Grades determined by homework			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Introduction of industrial microbiology		Quizzes Assignments Projects Midterm Exam Final Exam
2	2		Basic rules for industrial fermentation		
3	2		The primers used in industrial fermentation		
4	2		General principles of anaerobic fermentation		
5	2		Probiotics		
6	2		Production of antibiotics		
7	2		Brewing process		
8	2		Wine Production		
9	2		Lactic acid fermentation		
10	2		Bread fermentation		
11	2		General principles of aerobic fermentation		

12	2		Citric acid production		
13	2		Lipids production		
14	2		Single cell proteins (SCP) production		
15	2		Production of Penicillin		

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)	Matthews, K. R., Kniel, K. E., & Montville, T. J. (2017). Food microbiology: an introduction. John Wiley & Sons
Main References (sources)	Dorfman, J. (2014). Economics and management of the food industry. Routledge
Recommended Books and References (scientific journals, reports ... etc.)	Smith, J. S., & Hui, Y. H. (Eds.). (2008). Food processing: principles and applications. John Wiley & Sons.
Electronic References (websites ... etc.)	https://books.google.iq/books/about/An_Introduction_to_Industrial_Microbiolo.html?id=A50rDAAAQBAJ&source=kp_cover&redir_esc=y

Course Description Form

1. Course Name:					
Microbial Genetics					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Is obligatory					
6. Number of Credit Hours (Total)/Number of Units (Total) :					
30					
7. Course Administrator's Name (mention all, if more than one name)					
Name : Prof. Dr. Hadi Rahman Rasheed Al-Taai					
Email: hadialtaai@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives			<ul style="list-style-type: none"> To understand the basic principles of microbial genetics. To provide the student with the basic knowledge of genetics of prokaryotic in general To study the main characteristics of gene transfer To teach aseptic techniques. To provide an understanding of gene mapping 		
9. Teaching and Learning Strategies					
Strategy		Evaluation modalities 1- Practical tests 2- Theoretical tests 3- Reports and studies 4- Daily exams with self-solving questions 5- Grades determined by homework			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Introduction in microbial genetics		Quizzes Assignments Projects Midterm Exam Final Exam
2	2		Mutation as a mechanism of genetic change		
3	2		Repair of Errors in Nucleotide Incorporation		
4	2		Bacterial plasmid		
5	2		Horizontal gene transfer as mechanism change - DNA-Mediated Transformation		
6	2		Transduction		
7	2		Conjugation		
8	2		The Mobile Gene Pool		
9	2		Recombination process		
10	2		Gene mapping - Conjugational analysis		
11	2		Molecular techniques for gene mapping - Restriction Mapping		
12	2		A DNA Library - DNA Sequencing		
13	2		Polymerase Chain Reaction (PCR)		
14	2		Yeast genetic		

15	2		Virus genetic		
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)			Color Atlas of Genetics. (2007) . Eberhard Passarge, MD Professor of Human Genetics Former Director Institute of Human Genetics University Hospital Essen		
Main References (sources)			Germany Molecular Genetics of Bacteria (2004)Jeremy W. Dale and Simon F. ParkEssentials of Molecular Biology. (2013). V. Malathi .Department of Biochemistry Ethiraj College for Women Chennai		
Recommended Books and References (scientific journals, reports ... etc.)			From Genes to Genomes. (2012) Third Edition . Jeremy W. Dale, Malcolm von Schantz and Nick Plant University of Surrey, UK		
Electronic References (websites ... etc.)			http://www.wiley.com/go/dale/genes3e		

Course Description Form

1. Course Name:					
Molecular Biology					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Is obligatory					
6. Number of Credit Hours (Total)/Number of Units (Total) : 60/					
30					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Prof. Dr. Hadi Rahman Rasheed					
Email: hadialtaai@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives			<ul style="list-style-type: none"> To understand the basic principles of molecular biology. To provide the student with the basic knowledge of molecular genetics of eukaryotic and prokaryotic in general To study the main characteristics of DNA importance and their identification. To teach aseptic techniques. To provide an understanding of central dogma 		
9. Teaching and Learning Strategies					
Strategy		Evaluation modalities 1- Practical tests 2- Theoretical tests 3- Reports and studies 4- Daily exams with self-solving questions 5- Grades determined by homework			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Introduction in molecular Biology – Structure of Protein –Nucleic acid		Quizzes Assignments Projects Midterm Exam Final Exam
2	2		DNA Conformations - Types of DNA		
3	2		DNA as a Carrier of Genetic Information		
4	2		Physical Properties of the DNA		
5	2		Prokaryotic chromosome structure - Chromatin Structure		
6	2		Types of RNA		
7	2		DNA Replication of Prokaryotic Cells		
8	2		DNA Replication of eukaryotic Cells		
9	2		Prokaryotic Transcription		
10	2		Eukaryotic Transcription		
11	2		Translation Process -Mechanism of Protein Synthesis		
12	2		Regulation of transcription in prokaryotes		

13	2		Eukaryotic Gene Regulation		
14	2		Genetic Engineering		
15	2		Gene cloning - Genomics - Metagenomics		

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)	Instant Notes In Molecular Biology. (2005) Third Edition Phil Turner, Alexander McLennan, Andy Bates & Mike White School of Biological Sciences, University of Liverpool, Liverpool, UK
Main References (sources)	Essentials of Molecular Biology. (2013). V. Malathi .Department of Biochemistry Ethiraj College for Women Chennai
Recommended Books and References (scientific journals, reports ... etc.)	From Genes to Genomes. (2012) Third Edition . Jeremy W. Dale, Malcolm von Schantz and Nick Plant <i>University of Surrey, UK</i>
Electronic References (websites ... etc.)	http://www.wiley.com/go/dale/genes3e

Course Description Form

1. Course Name:					
Virology					
2. Course Code:					
3. Semester/Year:					
Semester					
4. Description Preparation Date:					
1/4/2024					
5. Available Attendance Forms:					
Is obligatory					
6. Number of Credit Hours (Total)/Number of Units (Total) :					
30					
7. Course Administrator's Name (mention all, if more than one name)					
Name :Dr. Ansam Dawod Salman Email: ansamdawood@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives			<ul style="list-style-type: none"> • A. Introduction to virology • B. Studying the internal structure of viruses • C. Identifying and studying the basics of virus classification • D. Identification and study of medical viruses • E. Studying the most important viral diseases 		
9. Teaching and Learning Strategies					
Strategy		1-Lecture method, use of the interactive whiteboard, presentation, and use of explanatory films - explanation and clarification 2- Asking students a set of questions about viruses during the lectures, such as what, how, when and why for specific topics 3-Giving students homework that requires studying a specific type of virus in all its details.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Definition of Virology-structure-classification		Quizzes Assignments Projects Midterm Exam Final Exam
2	2		Replication of viruses and genetic		
3	2		Transmission of viruses and pathogenesis		
4	2		Defense mechanisms		
5	2		Laboratory diagnosis of viruses		
6	2		DNA envelope viruses		
7	2		Virus environment		
8	2		RNA enveloped viruses		
9	2		Herpesviruses		
10	2		DNA no enveloped viruses		
11	2		Paramixoviruses		
12	2		Compares of DNA and RNA viruses		
13	2		RNA non enveloped viruses		
14	2		Picornaviruses and tumor viruses		
15	2		Vaccination and vaccine to viruses		
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)	Brooks, G. F., Butel, J. S., & Morse, S. A. (2001). Jawetz, Melnick, & Adelberg's medical microbiology. (No Title).
Main References (sources)	Howley, P. M., & Knipe, D. M. (2020). Fields virology: Emerging viruses. Lippincott Williams & Wilkins.
Recommended Books and References (scientific journals, reports ... etc.)	
Electronic References (websites ... etc.)	McEntyre, J., & Lipman, D. (2001). PubMed: bridging the information gap. Cmaj, 164(9), 1317-1319.

Course Description Form

1. Course Name:

Biotechnology

2. Course Code:

3. Semester/Year:

Semester

4. Description Preparation Date:

1/4/2024

5. Available Attendance Forms:

Is obligatory

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

30

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

Name: Prof. Dr. Hadi Rahman Rasheed

Email: hadialtaai@uodiyala.edu.iq

8. Course Objectives

Course Objectives

- To understand the basic principles of Biotechnology
To provide the student with the basic knowledge of Biotechnology of eukaryotic and prokaryotic in general
- To study the main characteristics of DNA importance and their identification.
- To teach aseptic techniques.
- To provide an understanding of Biotechnology techniques

9. Teaching and Learning Strategies

Strategy

Evaluation modalities

1- Practical tests

2- Theoretical tests

3- Reports and studies

4- Daily exams with self-solving questions

5- Grades determined by homework

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Introduction of Biotechnology		Quizzes Assignments Projects Midterm Exam Final Exam
2	2		Microbiology culture techniques and their applications:		
3	2		Fermentation		
4	2		Plant Cells Cultures		
5	2		Animal Cells Cultivation		
6	2		Enzyme techniques (production, extraction, purification, and applied uses):		
7	2		Biotechnology Applications:		
8	2		Environmental Biotechnology		
9	2		Biotechnology modification		
10	2		Genetic Engineering		
11	2		Vectors		
12	2		Artificial Chromosomes		
13	2		Polymerase Chain Reaction-PCR		
14	2		Gene Therapy:		
15	2		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)	Mohapatra, P. K. (2013). Textbook of environmental biotechnology. IK International Pvt Ltd.
Main References (sources)	Seidman, L. A., Moore, C. J., & Mowery, J. (2021). Basic laboratory methods for biotechnology: Textbook and laboratory reference. CRC Press.
Recommended Books and References (scientific journals, reports ... etc.)	Bhatia, S. C. (2005). Textbook of Biotechnology. Atlantic Publishers & Dist.
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:
Pathogenic bacteria
2. Course Code:
3. Semester/Year:
Semester

4. Description Preparation Date:

1/4/2024

5. Available Attendance Forms:

Is obligatory

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

30

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

Name :Dr. Ansam Dawod Salman

Email: ansamdawood@uodiyala.edu.iq

8. Course Objectives**Course Objectives**

- A. Introduction to virology
- B. Studying the internal structure of viruses
- C. Identifying and studying the basics of virus classification
- D. Identification and study of medical viruses
- E. Studying the most important viral diseases

9. Teaching and Learning Strategies**Strategy**

- 1-Lecture method, use of the interactive whiteboard, presentation, and use of explanatory films - explanation and clarification
- 2- Asking students a set of questions about viruses during the lectures, such as what, how, when and why for specific topics
- 3-Giving students homework that requires studying a specific type of virus in all its details.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Staphylococcus aureus		Quizzes Assignments Projects Midterm Exam Final Exam
2	2		<i>Streptococcus pyogens</i>		
3	2		<i>Streptococcus pneumonia</i> , & <i>Strept viridians</i> , <i>Enterococci</i>		
4	2		<i>Niesseria meningitis</i> & <i>Neisseria gonorrhiae</i>		
5	2		<i>Clostriduum spp</i>		
6	2		<i>Bacillus anthrax</i>		
7	2		<i>Corynebacterium diphtheria</i>		
8	2		Salmonella .		
9	2		Enterobacteriaceae Escherichia coli		
10	2		Kliebsella a pneumoni and proteus spp		
11	2		Salmonella and shigella		
12	2		Vibrio cholera & Brucella.		
13	2		. Mycobacterium tuberculosis		
14	2		Acinetobacter baumannii		
15	2		Haemophilus influenzae & H pylori		

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)

Mahon, C. R., & Lehman, D. C. (2022). Textbook of Diagnostic Microbiology-E-Book: Textbook of Diagnostic Microbiology-E-Book. Elsevier Health Sciences.

Main References (sources)

Todar, K. (2004). Todar's online textbook of bacteriology.

Recommended Books and References (scientific journals, reports ... etc.)	Schwartz, I., & Wormser, G. P. (2002). Bacterial pathogenesis: A molecular approach.
Electronic References (websites ... etc.)	

Course Description Form

1. Course Name:	
	Pathological Analysis
2. Course Code:	
3. Semester/Year:	
	Semester
4. Description Preparation Date:	
	1/4/2024
5. Available Attendance Forms:	
	Is obligatory

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

30

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

Name: Prof. Dr. Hadi Rahman Rasheed

Email: hadialtaai@uodiyala.edu.iq**8. Course Objectives****Course Objectives**

- To understand the basic principles of Pathological Analysis
- To provide the student with the basic knowledge of Pathological Analysis in eukaryotic and prokaryotic in general
- To study the main characteristics of Pathological Analysis importance and their identification.
- To teach aseptic techniques.

9. Teaching and Learning Strategies**Strategy**

Evaluation modalities

1- Practical tests

2- Theoretical tests

3- Reports and studies

4- Daily exams with self-solving questions

5- Grades determined by homework

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Introduction & Definition of pathogenic analysis .		Quizzes Assignments Projects Midterm Exam Final Exam
2	2		Factors effect to pathogenic analysis and branches .		
3	2		GUE biochemical and physical test		
4	2		GUE : Microscopic tests		
5	2		General stool examination .		
6	2		SEMINAL TESTS .		
7	2		CSF ANALYSIS .		
8	2		Lab technology		
9	2		Serological test		
10	2		Allergic test		
11	2		Polymerase chain reaction		
12	2		HEMATOLOGICAL TESTS		
13	2		. Hematology		
14	2		Biochemical tests		
15	2		Biological 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)	Mohan, H. (2018). Textbook of pathology. Jaypee Brothers Medical Publishers.
Main References (sources)	Herrington, C. S. (Ed.). (2020). Muir's textbook of pathology. CRC Press.
Recommended Books and References (scientific journals, reports ... etc.)	Krishna, V. (2004). Textbook of pathology. Orient Blackswan.

Electronic References (websites ... etc.)	
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Course Description Form

1. Course Name:	
	Antibiotic
2. Course Code:	
3. Semester/Year:	
	Semester
4. Description Preparation Date:	
	1/4/2024
5. Available Attendance Forms:	
	Is obligatory
6. Number of Credit Hours (Total)/Number of Units (Total)	
	30
7. Course Administrator's Name (mention all, if more than one name)	

Name: Prof. Dr. Hadi Rahman Rasheed

Email: hadialtaai@uodiyala.edu.iq

8. Course Objectives

Course Objectives

- To understand the basic principles of Antibiotic
- To provide the student with the basic knowledge of Antibiotic in eukaryotic and prokaryotic in general
- To study the main characteristics of Antibiotic importance and their identification.
- To teach aseptic techniques.
- Learn about ways to resist antibiotics

9. Teaching and Learning Strategies

Strategy

Evaluation modalities

1- Practical tests

2- Theoretical tests

3- Reports and studies

4- Daily exams with self-solving questions

5- Grades determined by homework

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2		Introduction - General characteristics - General definitions		Quizzes Assignments Projects Midterm Exam Final Exam
2	2		Mechanism of action of antibiotics on the cell wall		
3	2		Mechanism of action of antibiotics on the cell membrane		
4	2		Mechanism of action of antibiotics that inhibit protein synthesis		
5	2		Mechanism of action of antibiotics that inhibit nucleic acid synthesis		
6	2		Antibiotic resistance		
7	2		The effectiveness of antibiotics inside the body and their metabolism		
8	2		Penicillins and cephalosporins		
9	2		Quinolones		
10	2		Tetracyclines		
11	2		Macrolide group		
12	2		Peptide antibodies		
13	2		The use of antibiotics in the food and animal fields		
14	2		Biochemical tests on antibiotics		
15	2		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)	Lockhart, P. B., Loven, B., Brennan, M. T., & Fox, P. C. (2007). The evidence base for the efficacy of antibiotic prophylaxis in dental practice. <i>The Journal of the American Dental Association</i> , 138(4), 458-474.
Main References (sources)	Ritter, J., Lewis, L., Mant, T., & Ferro, A. (2008). <i>A textbook of clinical pharmacology and therapeutics</i> . CRC Press.
Recommended Books and References (scientific journals, reports ... etc.)	Seifert, R. (2019). <i>Basic knowledge of pharmacology</i> . Cham: Springer International Publishing.

Electronic References (websites ... etc.)	
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