
**Ministry education High And search Scientific device Supervision And the calendar Scientific**

**circle a guarantee the quality And accreditation Academic to divide Accreditation**

# MODULES DESCRIPTION

# وصف المواد الدراسية

**2024-2025**

# Introduction

## Key Concepts and Terms Academic Program Description

The academic program is viewed as an integrated and coordinated system of courses, designed and organized systematically to form a cohesive educational curriculum aimed at providing students with gradual educational, knowledge, and practical experiences. The primary goal is to develop and refine students' knowledge, skills, and professional competencies, enabling them to integrate efficiently into the labor market and respond to societal needs and sustainable development requirements. The academic program is subject to annual periodic review through internal and external audit mechanisms, such as the External Examiner Program, to ensure its quality and alignment with national and international standards. The academic program description represents a concise and objective document that includes the program's main characteristics and structure, accurately presenting the skills, knowledge, and values imparted to students. This description is directly linked to the program's mission and objectives and is a fundamental pillar for obtaining programmatic academic accreditation. Therefore, its preparation involves the collaboration of faculty members under the supervision of scientific committees in academic departments, reflecting the collective and institutional nature of the educational process. This guide, in its second edition, provides a comprehensive update to the description of academic programs, taking into account changes in the educational system in Iraq. The current guide includes a presentation of programs in their traditional formats (annual or semester systems), in addition to adopting the unified academic description model circulated by the Department of Studies, Planning, and Follow-up via letter No. 3/2906/م ت on 3/5/2023, especially for programs that have adopted the Bologna path as a basis for their structure. From this perspective, we emphasize that preparing an accurate description of academic programs and courses represents a strategic step to ensure the quality of education and achieve harmony between learning outcomes and labor market needs, as well as being a fundamental tool to support institutional and programmatic evaluation and accreditation effort.

A comprehensive summary outlining the vision, mission, and general objectives of the program, including targeted learning outcomes designed according to specific and clear learning and teaching strategies.

**Course Description** A specific summary that outlines the main characteristics of the course and the educational outcomes expected to be achieved by students upon completion. The course description is derived from the program description to ensure consistency and coherence.

**Program Vision** An ambitious vision for the future of the program that defines its features as a modern, motivating, and applicable program that meets the requirements of academic and societal development.

**Program Mission** A concise statement outlining the purpose of the program, its core objectives, and the activities and means to achieve them, in addition to outlining the program's future development and directions.

**Program Objectives** Specific and measurable statements describing what the academic program aims to achieve within a certain period, including academic, professional, and societal dimensions.

**Curriculum Structure** The set of courses that make up the program according to the adopted system (annual, semester, or Bologna path), including requirements of the ministry, university, college, and scientific department, in addition to the number of credit hours for each course.

**Learning Outcomes** Each course's learning outcomes are formulated to directly contribute to achieving the program's overall objectives.

**Teaching and Learning Strategies** The plans and educational methods followed by faculty members to develop learning, including classroom, practical, and field activities, to ensure the achievement of desired educational outcomes.

**The Expanded Importance** Writing academic program descriptions is not limited to being an administrative or academic requirement but represents a strategic tool that serves several functions simultaneously:

1. **For Students**: The description serves as a roadmap for their academic journey, outlining what is expected of them and the outcomes they will achieve, thereby enhancing their awareness and responsibility towards the educational process.
2. **For Faculty Members**: The description provides an organizational tool that helps unify vision, coordinate efforts, and direct educational activities in line with program objectives.
3. **For Accreditation and Oversight Bodies**: The description is an official document proving the institution's commitment to academic standards, quality assurance, and continuous improvement.

In the context of modern trends in higher education, adopting a model for describing programs and courses according to international standards like the Bologna path is a fundamental pillar for ensuring the competitiveness and global recognition of academic programs. This opens wider horizons for students in terms of academic mobility, employment, and lifelong learning, in addition to enhancing the academic institution's reputation locally and internationally.

## The Relationship Between Learning Outcomes and the Labor Market

Learning outcomes are the cornerstone in designing academic programs, representing the practical indicators that determine the level of knowledge, skills, and values acquired by students upon successful completion of the program. However, their importance is not limited to the internal academic framework but extends to form a direct link between higher education and labor market needs. An effective academic program translates its objectives into measurable and practically applicable learning outcomes that align with the required qualifications in the local, regional, and international labor market. Therefore, formulating learning outcomes should be based on a thorough analysis of market requirements through:

1. **Continuous consultation with employers and professional institutions** to ensure that the outcomes align with the skills actually required.
2. **Integrating 21st-century skills** such as critical thinking, problem-solving, teamwork, effective communication, and the ability to use modern technology.
3. **Achieving a balance between theoretical and practical aspects**, ensuring that students not only acquire theoretical knowledge but also train to apply it in practical, real-life, and professional contexts.
4. **Employing diverse assessment methods** to verify the achievement of outcomes, ranging from achievement tests to research projects, field training, and practical simulations.

From this perspective, the success of any academic program is measured by its ability to graduate students who possess professional and personal competencies that enable them to compete in the labor market and contribute to economic and societal development. Thus, learning outcomes become a strategic tool to ensure that university education is not confined to classrooms but transforms into a fundamental lever for human and economic development.

# نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة ديالى

الكلية\ المعهد: العلوم

القسم العلمي: قسم التقانة الاحيائية

اسم البرنامج الاكاديمي او المهني: البكالوريوس

اسم الشهادة النهائية: بكالوريوس في التقانة الاحيائية

النظام الدراسي: الفصلي و نظام مسار بولونيا

تاريخ اعداد الوصف: 20 \ 10 \ 2024

تاريخ ملئ الملف: 20 \ 1 \ 2025

التوقيع:

اسم رئيس القسم: أ. د. علياء معن عبد الحميد

التاريخ: 2025-01-20

التوقيع:

اسم المعاون العلمي: أ. د. منذر حمزة راضي

التاريخ: 2025-01-20

دقق الملف من قبل:

شعبة ضمان الجودة و الأداء الجامعي

اسم مدير شعبة ضمان الجودة و الأداء الجامعي: أ. م. غسان صبيح محمود

التاريخ:

التوقيع:

مصادقة السيد العميد

أ.د. طه محمد حسن

## 1. See the program

Working according to a solid program that achieves leadership and excellence in the academic and research field, taking into account national and internationalquality standards and academic accreditation.

## 2. Program message

The Department of Biotechnology is committed to providing specialized programs that meet national needs, including qualifying students with the skills and knowledge necessary for the requirements and needs of society Commitment to national and international quality standards in preparing competent graduates capable of academic and research work and meeting the requirements of the labor market The department seeks to improve and develop program quality standards to keep pace with the continuous changes in community needs through periodic review of the department's plan, goals, and mission

## 3. Program Goals

Providing the labor market with graduates with a high level of scientific and practical competence

Developing scientific and academic research capabilities and encouraging innovation for teachers and students

Transferring the cognitive skills of teachers, researchers and graduates to society Achieving advanced ranks in academic classifications locally, regionally and globally Communicating with leading local and international academic and research bodies to achieve the maximum possible benefit by forming joint research teams and benefiting

from accumulated experience and research capabilities for scientific advancement

| 4. program accreditation |
|---|
| Is the program accredited? If yes, by which accrediting body? The accreditation documents have been uploaded |

| 5. Other external influences |
|---|
| No |

| 6. Program structure | | | | |
|---|---|---|---|---|
| * comments | percentage | Study unit | Number of courses | Program structure |
| | 7.4% | 9 | 4 | Enterprise requirements |
| | 28.9% | 35 | 6 | College requirements |
| | 100% | 121 | 38 | Department requirements |
| | | Satisfied | 1 | summer training |
| | | | | Other |

| 7. Program Description | | | | |
|---|---|---|---|---|
| Credit hours | | Course Name | Course Code | Year/ level |
| practical | Theoritical | | | |
| 2 | 2 | Principles of Biotechnological Techniques 1 | BIT-1201 | level One /First |
| 2 | 2 | General Biology | BIT-1101 | |
| 2 | 2 | Analytical Chemistry | BIT-1102 | |
| 2 | 2 | Biophysics | 03B | |

| | | | | |
|---|---|---|---|---|
| _____ | **2** | **Human Rights and Democracy** | UD14 | |
| _____ | **2** | **English Language 1** | UD11 | |
| **2** | **2** | **Principles of Biotechnological Techniques 2** | BIOT-1207 | **level One / Second** |
| **2** | **2** | **General Biology 2** | BIOT-1208 | |
| **2** | **2** | **Organic Chemistry** | COS-1209 | |
| _____ | **2** | **Biostatistics** | BIT-1204 | |
| **2** | **2** | **Computer Science** | UD13 | |
| _____ | **2** | **Arabic Language 1** | UD12 | |
| **2** | **2** | **Microbiology 1** | BIOT-2313 | **Level Two/ First** |
| **2** | **2** | **Microbial Environment** | BIOT-2314 | |
| **2** | **2** | **Nanobiotechnology** | BIOT-2315 | |
| **2** | **2** | **Biochemistry 1** | BIOT-2316 | |
| **2** | **2** | **Animal Physiology** | BIOT-2317 | |
| _____ | **2** | **Biosafety and Biosecurity** | BIOT-2318 | |
| _____ | **2** | **Baathist Crimes in Iraq** | UD24 | |
| | **2** | **English Language 2** | UD21 | |
| **2** | **2** | **Microbiology 2** | BIOT-2419 | **Level Two/second** |
| **2** | **2** | **Biological Control** | BIOT-2420 | |

| | | | | |
|---|---|---|---|---|
| **2** | **2** | **Biochemistry 2** | BIOT-2422 | |
| **2** | **2** | **Histological and Microscopic Preparations** | BIOT-2423 | |
| _____ | **2** | **Arabic Language 2** | UD22 | |
| **2** | **2** | **Computer Science 2** | UD23 | |
| **2** | **2** | **Food Microbiology** | | **Third/First** |
| **2** | **2** | **Animal Tissue Culture** | | |
| **2** | **2** | **mushrooms** | | |
| **2** | **2** | **Molecular techniques** | | |
| **2** | **2** | **Viruses and vaccines** | | |
| **2** | **2** | **Antibiotics** | | **Third/second** |
| **2** | **2** | **Design of experiments** | | |
| **2** | **2** | **Cellular genetics** | | |
| **2** | **2** | **Microbiology genetics** | | |
| **2** | **2** | **immunity** | | |
| **2** | **2** | **Bioinformatics** | | **Fourth/first** |
| **2** | **2** | **Medicinal mushrooms** | | |
| **2** | **2** | **Enzymes** | | |

| | | | | |
|---|---|---|---|---|
| **2** | **2** | **Immunological genetics** | | |
| **2** | **2** | **Industrial microbiology** | | |
| **2** | **2** | **Plant tissue culture** | | **Fourth/second** |
| **2** | **2** | **toxicology** | | |
| **2** | **2** | **Satisfactory analyzes** | | |
| **2** | **2** | **Plant chemistry** | | |
| **2** | **2** | **Genetic Engineering** | | |
| | | **Research project** | | |

| 8. Expected learning outcomes of the program | |
|---|---|
| **Knowledge** | |
| Learning outcomes 1 | Satisfied |
| **Skills** | |
| Learning outcomes 2 | Satisfied |
| Learning outcomes 3 | Satisfied |
| **Value** | |
| Learning outcomes 4 | Satisfied |
| Learning outcomes 5 | Satisfied |

## 9. Teaching and learning strategies

Theoretical lectures according to the approved curriculum. Quizzes and brainstorming after the lecture.

Conduct scientific discussions in class.

Submitting scientific reports on the subject area during the semester. Stimulating knowledge exchange among students.

## 10. Evaluation methods

This is done by testing students theoretically, practically, and orally (seminars) ,classroom activities, and more Safia, scientific reports

Motivating the student by encouraging the free generation of ideas, accepting them, and training him in the skill of brainstorming.

## 11. Education institution

## Faculty members

| Preparing the teaching staff | | Special reqirements/ skills | Specialization | | Degree | Position within the Department | Scientific rank |
|---|---|---|---|---|---|---|---|
| **Lecturer** | **Angel** | | **Private** | **General** | | | |
| | | | Biotechnology | Life Sciences | PhD | Department Head | Professor |
| | | | Medicinal Plants | Life Sciences | PhD | Faculty Member | Assistant Professor |
| | | | Plant Biology | Life Sciences | PhD | Faculty Member | Assistant Professor |
| | | | Microbiology | Life Sciences | PhD | Faculty Member | Assistant Professor |
| | | | Molecular Biology (Plant/Fungi) | Microbiology | PhD | Faculty Member | Assistant Professor |
| | | | Biotechnology | Life Sciences | PhD | Faculty Member | Lecturer |
| | | | Microbiology | Life Sciences | PhD | Evening Study Coordinator | Lecturer |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Biotechnology Sciences | Life Sciences | Master's | Faculty Member | Lecturer |
| | | | Zoology | Biotechnology Sciences | PhD | Faculty Member | Lecturer |
| | | | Ecology | Life Sciences | Master's | Faculty Member | Assistant Lecturer |
| | | | Life Sciences (Animal Branch) | Life Sciences | Master's | Faculty Member | Assistant Lecturer |
| | | | Immunology | Life Sciences | Master's | Morning Study Coordinator | Assistant Lecturer |
| | | | Cellular Genetics | Life Sciences | Master's | Faculty Member | Assistant Lecturer |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Life Sciences | Life Sciences | Master's | Faculty Member | Assistant Lecturer |
| | | | Medical Parasitology | Life Sciences | Master's | Faculty Member | Assistant Lecturer |
| | | | Cellular Genetics + Molecular Biology | Biotechnological Techniques | PhD | Faculty Member | Assistant Lecturer |
| | | | Histology and Animal Anatomy | Life Sciences | PhD | Faculty Member | Assistant Lecturer |
| | | | Analytical Chemistry | Chemistry | Master's | Faculty Member | Assistant Lecturer |
| | | | Life Sciences | Life Sciences | Master's | Faculty Member | Assistant Lecturer |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Microbiology | Life Sciences | PhD | Faculty Member | Lecturer |
| | | | Microbiology | Life Sciences | PhD | Faculty Member | Lecturer |
| | | | Medical Microbiology | Life Sciences | Masters | Faculty Member | Assistant Lecturer |

**Professional development**

**Orienting new faculty members**

The new faculty member's familiarity with the university, its development vision, its plan towards internationalization, and its development programs.

Helping the new faculty member adapt practically and psychologically and alleviating anxiety that could hinder his participation and integration into university work and activities.

Providing the opportunity for the new faculty member to build a network of relationships and communicate with his peers from other departments and colleges.

The new faculty member's familiarity with his rights and duties (administrative and legal) Developing the faculty member's skills in teaching, learning, and managing the educational

process

**Professional development for faculty members**

- Technical development and its implications on the educational process in terms of employing information and communication technology and learning and teaching techniques.
- Institutional development, which includes development planned and supervised by a

,specialized unit at the university , which can employ ongoing training courses, workshops discussion panels, hosting visiting professors, and exchanging visits and research contributions.

- Holding continuing education courses on teaching methods, developments in them, and keeping pace with them.

Self-development to acquire psychological and cognitive skills

- Continuous improvement and development of faculty members through training programs and workshops inside and outside the department, university and country Encouraging faculty members to obtain the highest academic and administrative ranks through promotions.

## 12. Acceptance standard

The Biotechnology Department is subject to the work mechanism of the Ministry ofHigher Education and Scientific Research/Central Admissions Department, where graduates of preparatory school (scientific branch) are nominated for admission to the

epartment based on their graduation rates.

## 13. The most important sources of information about the program

The curriculum approved by the Ministry of Higher Education and Scientific Research and its guidelines.

Decisions and recommendations of scientific committees in the department and university Courses in developmental teaching methods.

Self-evaluation report for previous yearsSSR. Description of courses.

Conferences, seminars, workshops and panel discussions. State institutions

related to the department's specializations. Graduates Unit.

Searches in global databases for similar experiences. Personal experiences.

## 14. Program development plan

Modernizing study plans and scientific curricula by keeping pace with global developments and using modern sources to keep pace with the labor market, as

.well as modernizing, developing and diversifying learning and teaching methods

# Program skills chart

| Learning outcomes required from the programme | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Value | | | | Skills | | | | Knowledge | | | | Essential o ?optional | Course Name | Course Code | Year/level |
| C4 | C3 | C2 | C1 | B4 | B3 | B2 | B 1 | A4 | A3 | A2 | A1 | | | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Principles of Biotechnology 1 | BIT-1201 | First |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | General Biology | BIT-1101 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Analytical Chemistry | BIT-1102 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Biophysics | 03B | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Human Rights and Democracy | UD14 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | English Language 1 | UD11 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Principles of Biotechnology 2 | BIOT-1207 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | General Biology 2 | BIOT-1208 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Organic | COS- | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Chemistry | 1209 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Biostatistics | BIT-1204 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Microbiology 1 | UD13 | Second |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Microbial Ecology | UD12 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Nanobiotechnology | BIOT-2313 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Biochemistry 1 | BIOT-2314 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Animal Physiology | BIOT-2315 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Biosafety and Biosecurity | BIOT-2316 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Baath Crimes in Iraq | BIOT-2317 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | English Language 2 | BIOT-2318 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Microbiology 2 | UD24 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Biological Control | UD21 | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Food Microbiology | | Third |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Plant Tissue Culture | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Animal Tissue Culture | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Mycology (Fungi) | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Molecular Techniques | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Virology and Vaccines | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Antibiotics | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Experimental Design | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Genetics | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Cellular Genetics | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اختياري | Genetics | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Microbiology | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Immunology | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Bioinformatics | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Medical Mycology | | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Enzymes | | Fourth |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اختياري | Immunogenetics | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Industrial Microbiology | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اختياري | Plant Tissue Culture | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اختياري | Toxicology | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Diagnostic Analysis | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Phytochemistry | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Genetic Engineering | | |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | اساسي | Research Project | | |

**Level First**

# Semester ONE

# MODULE DESCRIPTION FORM

# نموذج وصف المادة

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Principle of Biotechnology **1** | | | **Module Delivery** | |
| **Module Type** | Core | | | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar | |
| **Module Code** | BIOT-1101 | | | | |
| **ECTS Credits** | 7 | | | | |
| **SWL (hr/sem)** | 175 | | | | |
| **Module Level** | U( | | **Semester of Delivery** | 1 | |
| **Administering Department** | Biotechnology | | **College** | College of Science | |
| **Module Leader** | Ziyad Kalouf Radeef | | **e-mail** | zeyadkh.radeef@uodiyala.edu.iq | |
| **Module Leader's Acad. Title** | Lecturer | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | | | **e-mail** | | |
| **Peer Reviewer Name** | | | **e-mail** | | |
| **Scientific Committee Approval Date** | 01/06/2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents

| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | -1 Bachelor course in biotechnology offers the synergism of basic concepts of biology, biotechnology, molecular biology, genomics, Recombinant DNA technology, microbiology, biochemistry and bioinformatics with technological applications.<br>-2 The main objective of this degree course is to produce graduates with enhanced skills, knowledge and research aptitude to carry out higher studies, entrepreneurship or research and development in the various health, research and industrial areas.<br>-3 Develop proficiency in application of current aspects of biotechnology, molecular biology, Recombinant DNA technology, bioinformatics and genomics.<br>-4 Students will be able to use state of the art techniques relevant to academia and industry, generic skills and global competencies including knowledge and skills that enable the students to undertake further studies in the field of biotechnology, molecular biology, Recombinant DNA technology, genomics, microbiology, biochemistry or any other related field.<br>-5 Imparting an education that includes communication skills, the ability to work in a team with leadership quality, devoted to societal problems with an ethical attitude. |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | **-1** Prepares the students for immediate entry to the workplace with sound theoretical, experimental knowledge in the area of health and pharmaceuticals, biochemicals, biofuels, environment related, food and dairy, cosmetics, biopolymers and related multidisciplinary fields.<br>**-2** Overall, the course offers basic foundation in biotechnology which enables the students to understand the concepts in biochemistry, molecular biology, microbiology, genetic engineering and related industrial technology.<br>**-3** Students will be able to design, execute, record and analyse the results of experiments in field of molecular biology, genomics, Recombinant DNA technology, biochemistry, microbiology and genetic engineering.<br>**-4** Students will be able to work effectively in a group in the classroom, laboratory, industries and fieldbased situations.<br>**-5** Become efficient in using standard operating procedures and will be well versed with the regulations for safe handling and use of chemicals as well as IPR and biosafety issues related to experiments in field of biochemistry, microbiology and genetic engineering. |
| **Indicative Contents**<br>المحتويات الإرشادية | |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

| | |
|---|---|
| **Strategies** | Teaching/learning methods and strategies Lectures and practical classes provide the basic knowledge. A variety of coursework gives opportunities for extending knowledge and techniques. Individual and group projects reinforce techniques and give experience of practical applications. The programme topics are introduced by lectures but are developed fully by appropriate laboratory exercises during all parts of the programme. Students are required to work both as individuals and as part of groups. |

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)** الحمل الدراسي المنتظم للطالب خلال الفصل | 94 | **Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا | 6.26 |
| **Unstructured SWL (h/sem)** الحمل الدراسي غير المنتظم للطالب خلال الفصل | 81 | **Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5.4 |
| **Total SWL (h/sem)** الحمل الدراسي الكلي للطالب خلال الفصل | 175 | | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 2, 4 and 6 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4 and 6 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |

| | | | | | |
|---|---|---|---|---|---|
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 6 |
| **Summative assessment** | **Midterm Exam** | 2 hr | 10% (10) | 8 | LO # 1-7 |
| | **Final Exam** | 2hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | **Material Covered** |
|---|---|
| **Week 1** | Definition of the concept of biotechnologies |
| **Week 2** | Historical development of biotechnology before and after the World War |
| **Week 3** | Methods used to isolate microorganisms from the elements of the environment and types of nutritional requirements for them. |
| **Week 4** | Productive and enriching food media |
| **Week 5** | Different growth phases of bacteria and molds |
| **Week 6** | Culture media used in Biotechnological processes (Media components, optimization and sterilization) |
| **Week 7** | The effect of some factors on the growth and production of microorganisms such as heat, pH, Co2, light and some chemicals |
| **Week 8** | **Mid Exam** |
| **Week 9** | Types of tissue cultures such as meristems, callus and protoplast cultures |
| **Week 10** | Types of secondary metabolism and active compounds in the plant |
| **Week 11** | Determine the different levels in the production of biological materials such as laboratory level, experimental laboratory and industrial production |
| **Week 12** | Second exam |
| **Week 13** | Definition of industrial fermentors, materials used in their manufacture and factors affecting them |

| | |
|---|---|
| **Week 14** | Batch culture |
| **Week 15** | Continuous Farms |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

| | **Material Covered** |
|---|---|
| **Week 1** | Lab 1: Laboratory Equipment's |
| **Week 2** | Laboratory Equipment's (practically) |
| **Week 3** | Lab 2: Microorganism's growth requirements and culture media |
| **Week 4** | Microorganism's growth requirements and culture media(practically) |
| **Week 5** | Lab 3: The Isolation of Microorganisms from a different environments by a different techniques |
| **Week 6** | The Isolation of Microorganisms from a different environments by a different techniques(practically) |
| **Week 7** | Lab 4: Maintaining and preserving pure cultures |
| **Week 8** | Maintaining and preserving pure cultures(practically) |
| **Week 9** | Lab 5: The enumeration methods of Microorganisms |
| **Week 10** | The enumeration methods of Microorganisms(practically) |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | **Text** | **Available in the Library?** |
|---|---|---|
| **Required Texts** | • Smith, J. E. (2009). *Biotechnology* (5th ed.). Cambridge: Cambridge University Press. | |

| | | |
|---|---|---|
| | • Microbiology and Biotechnology (2001)<br>• A Text book of Biotechnology(2006) | |
| **Recommended Texts** | • Gupta, V., Sengupta, M., Prakash, J., & Tripathy, B. C. (2017). *Basic and applied aspects of biotechnology*. Springer Singapore.<br>• Crawford, C. (2018). *Principles of biotechnology*. 1st ed. New York: Salem Press.<br>• Patnaik, B. (2012). *Textbook of biotechnology*. New Delhi: Tata McGraw Hill Education.<br>• Dubey, R. C. (2014). *A textbook of Biotechnology*. S. Chand Publishing.<br>• Khan, F. A. (2020). Biotechnology fundamentals. CRC Press. | |
| **Websites** | | |

## Grading Scheme

مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | General Biology **1** | | | **Module Delivery** | |
| **Module Type** | Core | | | ☒ **Theory**<br>☐**Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar | |
| **Module Code** | BIOT-1102 | | | | |
| **ECTS Credits** | 7 | | | | |
| **SWL (hr/sem)** | 175 | | | | |
| **Module Level** | U( | | **Semester of Delivery** | 1 | |
| **Administering Department** | Biotechnology | | **College** | College of Science | |
| **Module Leader** | Alyaa Maan Abd Alhameed | | **e-mail** | alyaa.maen@uodiyala.edu.iq | |
| **Module Leader's Acad. Title** | Professor | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | | | **e-mail** | | |
| **Peer Reviewer Name** | | | **e-mail** | | |
| **Scientific Committee Approval Date** | 1/06/2024 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | 1. Finding new ways to produce enough nutritious food for a growing world population.<br>2. Breeding plants to tolerate the heat- and drought-stress caused by climate change.<br>3. Developing sustainable cropping practices to produce healthful food while protecting the environment.<br>4. Investigating new methods to fight plant diseases. |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | 1. To study about some biology terms, biology discipline, and botany discipline, the difference between Prokaryotic and Eukaryotic cells.<br>2. Study the planet cell.<br>3. Eukaryotic cell organelles, structure, composition and functions.<br>4. Understand the fundamental concept of the cell cycle, Mitosis, and its various stages, Meiosis, and its different phases.<br>5. Mendel's Laws of Inheritance.<br>6. Plant Tissues types.<br>7. Types of Root and Stem System of the plant.<br>8. Absorption of mineral salts of plant.<br>9. Translocation of organic solutes.<br>10. Growth and Growth hormones. |
| **Indicative Contents**<br>المحتويات الإرشادية<br>يتضمن الكلمات المفتاحية المهمة للمحاضرات | Indicative content includes the following.<br>-1 Introduction to the General Biology of Plant – morphology, Taxonomy, physiology, anatomy, Genetics, behavior, origin and distribution<br>-2 Study the planet cell – cell wall, cell membrane , protoplast, phragmoplast , middle- lamella.<br>-3 Cell Organelles – Plastid, leucoplast, chromoplast, chloroplast, stroma, etioplast, mitochondria.<br>-4 Other Cell Organelles – Ribosomes, Endoplasmic reticulum, polysome, Golgi bodies, Lysosome, spherosome, glyoxysome, peroxisome, cytoskeleton, Microelements. |

| | |
|---|---|
| | Microtubules - Intermediate filaments, Ergastic substances, Vacuole, Nucleus, Protoplasm . -5<br>Cell cycle – Mitosis, Meiosis, M phase, cytokinesis, Cyclins and cyclin-dependent protein kinases. -6<br>Mendel's Laws of Inheritance – Segregation, Monohybrid cross, Genotype, Phenotype, homozygous, dominant, Trait, recessive. -7<br>Plant Tissues types – Meristematic Tissues, Permanent Tissues, Simple Permanent Tissues, Parenchyma, Collenchyma, Sclerenchyma, Epidermis, Complex Permanent Tissue, Xylem, Phloem . -8<br>Types of Root System – Adventitious Roots, Taproot Roots, Assimilatory roots, Reproductive roots, Root-thorns, Floating roots, Buttress roots, Climbing roots, Contractile roots, Stilt roots, Prop roots. -9<br>Stem System – Nodes, Internodes, Terminal or apical bud, Lateral or axillary bud, petiole , pedicel, leaves , flowers, Seeds, Monocots, Dicots. -10<br>Absorption of mineral salts of plant – Ions, Contact Exchange, Carbonic acid Exchange, active absorption, Carrier Concept, Isotopic, saturation effects specificity. -11<br>Mineral Nutrition of the Plant –Osmotic Pressure , Catalytic Function, Antagonistic , Balancing Function. -12<br>-Translocation of organic solutes –Downward Translocation, Upward Translocation, Radial Translocation, Protoplasmic Streaming, Interfacial Flow Hypothesis, Active Diffusion. . -13<br>-Factors Controlling Translocation –Sink Active, Photosynthesis, Turgor Pressure, Phytohormones, Plasmodesmata. -14<br>Respiration –Oxidation , Carbohydrate, anaerobic respiration, Metabolism. -15<br>Growth and Growth hormones – Auxin, Cytokinins, Sigmoid Curve, Plant Hormones. -16 |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | 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 type of simple experiments involving some sampling activities that are interesting to the students. |

| **Student Workload (SWL)**<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 94 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 6.26 |
| **Unstructured SWL (h/sem)** | 81 | **Unstructured SWL (h/w)** | 5.4 |

| | | | |
|---|---|---|---|
| | الحمل الدراسي غير المنتظم للطالب أسبوعيا | | الحمل الدراسي غير المنتظم للطالب خلال الفصل |
| 175 | | **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | |

## Module Evaluation
تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| Formative assessment | Quizzes | 2 | 10% (10) | 5, 10 | LO #1, 3, 5 , 8 and 12 |
| | Assignments | 2 | 10% (10) | 2, 12 | LO # 2, 4, 6 and 9 |
| | Projects / Lab. | 1 | 10% (10) | Continuous | All |
| | Report | 1 | 10% (10) | 13 | LO # 3, 5, 6 and 9 |
| Summative ن assessment | Midterm Exam | 2 hr. | 10% (10) | 7 | LO # 1-7 |
| | Final Exam | 2hr | 50% (50) | 16 | All |
| Total assessment | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| Week 1 | Introduction to the General Biology of Plant |
| Week 2 | Study the planet cell |
| Week 3 | Cell Organelles |
| Week 4 | Microtubules |
| Week 5 | Cell cycle |
| Week 6 | Mendel's Laws of Inheritance |
| Week 7 | Plant Tissues types |
| Week 8 | The Midterm Exam |
| Week 9 | Types of Root System |
| Week 10 | Absorption of mineral salts of plant |
| Week 11 | Mineral Nutrition of the Plant |
| Week 12 | Translocation of organic solutes |

| | |
|---|---|
| **Week 13** | **Factors Controlling Translocation** |
| **Week 15** | **Respiration** |
| **Week 16** | **Growth and Growth hormones** |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

| | **Material Covered** |
|---|---|
| **Week 1** | Lab 1: Introduction: Branches of botany |
| **Week 2** | Lab 2: The solutions : Types of solutions |
| **Week 3** | Lab 3: The Light microscope: Experiment: Study onion cells by microscope. |
| **Week 4** | Lab 4: Plant Cell Structure. |
| **Week 5** | Lab 5: Plant pigments. |
| **Week 6** | Lab 6: Cell Division. |
| **Week 7** | Lab 7: Mendel's Laws Examples. |
| **Week 8** | Lab 8: Plant tissue. |
| **Week 9** | Lab 9: Flower of plant. |
| **Week 10** | Lab 10: Seeds of plant. |
| **Week 11** | Lab 11: Diffusion, Osmosis and Imbibition. |
| **Week 12** | Lab 12: Transpiration. |
| **Week 13** | Lab 13: The Plant Hormones. |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | **Text** | **Available in the Library?** |
|---|---|---|
| **Required Texts** | Pollard, T. D., Earnshaw, W. C., Lippincott-Schwartz, J., & Johnson, G. (2022). Cell biology E-book. Elsevier HealthSciences. | Yes |
| **Recommended Texts** | | |
| **Websites** | PRINCIPLES OF PLANT BIOTECHNOLOGY ICAR eCourse / 2015 | |

| Grading Scheme<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **Group** | **Grade** | التقدير | **Marks (%)** | **Definition** |
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** – Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM
# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Analytical | | | **Module Delivery** | |
| **Module Type** | Support | | | ☒ **Theory**<br>☐**Lecture**<br>☒ **Lab**<br>☐ **Tutorial**<br>☐ **Practical**<br>☒ **Seminar** | |
| **Module Code** | BIOT-1103 | | | | |
| **ECTS Credits** | **5** | | | | |
| **SWL (hr/Sem)** | **175** | | | | |
| **Module Level** | U( | | **Semester of Delivery** | | |
| **Administering Department** | Chemistry department | | **College** | College of Science | |
| **Module Leader** | Mohamed Jabar Mohamed | | **e-mail** | **mohammedjabbar0908@gmail.com** | |
| **Module Leader's Acad. Title** | Lecturer | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2024 | | **Version Number** | 0.1 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims**<br>**أهداف المادة الدراسية** | This module aims to cultivate a scientifically literate generation that embraces science as a foundation for transformative change, applying scientific knowledge and methods in critical thinking, analysis, and adaptation to evolving technologies and societal needs<br>This module will be included the main points:<br>**-1** Introduce students to the fundamental principles of volumetric analysis<br>**-2** Foster an understanding of the theoretical principles and practical applications of titration.<br>**-3** To ensure a comprehensive understanding of gravimetric analysis, calculations of gravimetric coefficients, studying the calculations of solubility product constants and determining the mathematical conditions for sediment formation.<br>**-4** Identify some instrument devices used in quantitative analysis |
| **Module Learning Outcomes**<br>**مخرجات التعلم للمادة الدراسية** | **.1 weight of substances in samples, including the preparation of solutions from solid or liquid materials.**<br>**.2 Provide students with a comprehensive knowledge of volumetric analysis, particularly titration, and its wide range of applications.**<br>**.3 Identify the types of acids, bases, ionization constants, and pH function calculations, as well as identify the acidic and basic properties of water and the ionization constant (Kw).**<br>**.4 Identify the hydrolysis of salts and its calculations**<br>**.5 Familiarize students with the fundamentals of Bufer solutions and its calculations**<br>**.6 Identify the basics of gravimetric analysis**<br>**.7 Studying the calculations of the solubility product constant and knowing when sediments form mathematically.**<br>**.8 Study the characteristics of the sediment and the factors affecting the solubility of the sediment, as well as the study of the factors that affect the formation of the sedimen**<br>**.9 Understand molecular spectroscopy in terms of principles and theoretical basis.** |
| **Indicative Contents**<br>**المحتويات الإرشادية** | Indicative content includes the following.<br>**-1** Methods for expressing the concentration of solutions<br>**-2** volumetric analysis, particularly titration,<br>**-3** Calculations of pH for acids, bases, salts and buffer solutions<br>**-4** Gravimetric analysis and calculations of the solubility product constant<br>**-5** Instrument devices used in quantitative analysis |

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

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ **15** اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 94 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 6.26 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 81 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5.4 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **175** | | |

| Module Evaluation<br>تقييم المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| | | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5 and 10 | LO #1, #2 and #10, #11 |
| | **Assignments** | 2 | 10% (10) | 2 and 12 | LO #3, #4 and #6, #7 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 13 | LO #5, #8 and #10 |
| | **Midterm Exam** | 2hr | 10% (10) | 7 | LO #1 - #7 |

| | | | | | |
|---|---|---|---|---|---|
| **Summative assessment** | **Final Exam** | 3hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

| **Delivery Plan (Weekly Syllabus)**<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | Introduction to analytical chemistry |
| **Week 2** | Solutions and classification of solutions |
| **Week 3** | Express concentrations of solutions |
| **Week 4** | Density and specific gravity of solution |
| **Week 5** | The relationship between molarity or normality with percentage concentration |
| **Week 6** | Diluting solutions |
| **Week 7** | Solve of some Problems |
| **Week 8** | Concentration by percent |
| **Week 9** | P -functions |
| **Week 10** | Volumetric analysis |
| **Week 11** | Standard solution |
| **Week 12** | Acid –Base equilibrium |
| **Week 13** | Buffer solution |

| | |
|---|---|
| **Week 14** | Enthalpy |
| **Week 15** | Type of enthalpy |
| **Week 16** | Energy of bonds |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab safety |
| **Week 2** | Laboratory equipments |
| **Week 3** | Laboratory techniques:distillation,filtration,centrifugation |
| **Week 4** | Vaporization,chromatography,decantation |
| **Week 5** | Pipets and pipet pumps, |
| **Week 6** | Volumetric analysis ( titration) |
| **Week 7** | Methods expressing concentration of solutions and calculations of |
| **Week 8** | Preparation of (0.1 N ) NaoH solution and standardization with (0.1 |
| **Week 9** | Preparation of (0.1 N ) HCL solution and standardization with sodium |
| **Week 10** | Determination of carbonate and bicarbonate in mixture |
| **Week 11** | Determination acidity of Vineger |
| **Week 12** | Determination of hardness of water |
| **Week 13** | Preparation and standardization of (0.1 N ) AgNO3 solution |
| **Week 14** | Determination of chloride according to modified Volhard method |
| **Week 15** | Complex formation reactions |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |

| | | |
|---|---|---|
| **1** | Skoog (Fundamentals of Analytical Chemistry) 9 edition (Thomson, 2014) | |
| **2** | Daniel harris (Quantitative chemical analysis ) (2006) | |
| **3** | Gary D. Christian (Analytical Chemistry ) 7th Ed, 2014 | |

**Grading Scheme**

مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة

| Module Information<br>معلومات المادة الدراسية | | | |
|---|---|---|---|
| **Module Title** | Biophysics | **Module Delivery** | |
| **Module Type** | Support | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar | |
| **Module Code** | BIOT-1104 | | |
| **ECTS Credits** | 5 | | |
| **SWL (hr/sem)** | 125 | | |
| **Module Level** | U( | **Semester of Delivery** | 1 |

| | | | |
|---|---|---|---|
| **Administering Department** | Physics Department | **College** | College of Science |
| **Module Leader** | Raghd Talal | **e-mail** | raghadtalal@uodiyala.edu.iq |
| **Module Leader's Acad. Title** | Assistant Lecturer | **Module Leader's Qualification** | Ph.D. |
| **Module Tutor** | | **e-mail** | |
| **Peer Reviewer Name** | | **e-mail** | |
| **Scientific Committee Approval Date** | 301/06/202 | **Version Number** | 1.0 |

## Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

| | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

**Module Aims**

أهداف المادة الدراسية

1. Teaching students the basic principles of physics.
2. Preparing specialists in the field of general physics and its practical applications, which bears the responsibility of studying the country's need for development and progress and capable of meeting the needs of the job market in state institutions and industry sectors.
3. Preparing an educated generation armed with science and adopts it as a sound basis to bring about radical changes and assign scientific knowledge and scientific methods in thinking, analysis and adaptation with the development of technologies, to keep up with the expansion of human needs.
4. Effective contribution for deepening and documenting the connection of the university with the society through the implementation of advisory counseling, training and development of teaching and administrative staff.
5. The service of preparing graduates specialized in physics who contribute to development in the country.
6. Meeting the needs of various sectors with highly qualified personals in the field of physics.
7. Encouraging the distinguished in this field to work as teaching assistants in the department to be part of the academic teaching staff in the future.

| | |
|---|---|
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | -1 enable students to obtain knowledge and understanding of the concept of physics.<br>-2 Enable students to obtain knowledge and understanding of the scientific laws of physics.<br>-3 Enable students to keep pace with scientific development in all scientific fields ofphysics. |
| **Indicative Contents**<br>المحتويات الإرشادية | This course contains a lot of vocabulary, which is a branch of physics concerne and properties of matter and energy. It includes an introduction to understanding natural phenomena, the forces and affecting their course, and the formulation of knowledge into laws that do not on aforementioned processes, but also predict the course of natural processes with gradually approach reality. The topic of general physics includes an introduction to physics, vector analysis in linear motion, circular motion, and rotational motion. Also, gravitational for torque, angular momentum, laws of motion with constant or uniform accelerate rotational motion, dynamic fluids, static fluids, particle stability, electric charge and electric potential in electrical circuits and ray optics. |

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

| **Student Workload (SWL)**<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.26 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 46 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3.06 |
| **Total SWL (h/sem)** | 125 | | |

| | |
|---|---|
| الحمل الدراسي الكلي للطالب خلال الفصل | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| Formative assessment | Quizzes | 2 | 10% (10) | 5, 10 | LO #1, 2, 4 and 6 |
| | Assignments | 2 | 10% (10) | 2, 12 | LO # 3, 4 and 6 |
| | Projects / Lab. | 1 | 10% (10) | Continuous | All |
| | Report | 1 | 10% (10) | 13 | LO # 5, 8 and 6 |
| Summative assessment | Midterm Exam | 2 hr | 10% (10) | 8 | LO # 1-7 |
| | Final Exam | 2hr | 50% (50) | 16 | All |
| Total assessment | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| Week 1 | A brief summary of the vectors, scalar and vector quantities, addition of vectors, unit vector, component of vectors, dot product and cross product. With examples for all these topics. |
| Week 2 | Motion on a straight line: Displacement, Average velocity, Instantaneous velocity, Average acceleration, and Instantaneous acceleration. With examples for all these topics. |
| Week 3 | Application of Motion with a constant acceleration: Freely falling bodies, and Projectile of motion. With examples for all these topics. |
| Week 4 | Understanding of forces, Newton's first law, Newton's second law, Newton's third law, and mass and weight. Equilibrium of a particle: With examples for all these topics. |
| Week 5 | Friction force, inclined plane, Torque of force, Center of gravity of the body, Center of mass, Motion of a system of particle, and Newton's law of universal gravitation. With examples for all these topics |

| | |
|---|---|
| **Week 6** | Circular and Rotational motion: Motion in a circle, uniform circular motion, central or radial force,non-uniform circular motion, Central or radial acceleration, Central force, tangential acceleration, and tension in circular motion. With examples for all these topics. |
| **Week 7** | Rotational motion, angular displacement, angular velocity, and angular acceleration. With examples for all these topics. |
| **Week 8** | **Midterm exam** |
| **Week 9** | Rotational motion with a constant angular acceleration, relation between angular and linear velocity and acceleration, torque, angular acceleration, and moment of inertia. With examples for all these topics. |
| **Week 10** | Elasticity: The street and strain, elastic modulus, Hook's law, tensile and compressive stress and strain, Young's modulus, bulk stress and strain, bulk modulus, compressibility, shear stress and strain, Poisson's ratio, and force constant. With examples for all these topics. |
| **Week 11** | Static fluids: Density, specific gravity, pressure in a fluid, atmospheric pressure, pressure-depth-Pascal's law, buoyancy, Archimedes principle, and define the surface tension. With examples for all these topics. |
| **Week 12** | Dynamic fluids: Ideal fluid, the continuity equation, Bernoulli's equation, Venturi meter, and define the viscosity. With examples for all these topics. |
| **Week 13** | Electric charge and electric field: Conductor, insulator, and induced charges. Coulomb's law, electric field, intensity of electric field, electric potential energy, electric potential energy in a uniform field, electric potential energy of two point charges, potential difference, potential gradient, equipotential surfaces, and electric potential. With examples for all these topics. |
| **Week 14** | Geometric optics: Nature and propagation of light, wave front, properties of light, types of reflection, index of refraction, laws of reflection and refraction, total internal reflection, real and apparent depth, refraction by prism. |
| **Week 15** | mirrors & lenses: Spherical mirrors, image formations, spherical aberration, types of simple lenses, converging lens, diverging lens, properties of lenses, image formation by thin lenses, |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

| | **Material Covered** |
|---|---|
| **Week 1** | Moment of inertia for flywheel |
| **Week 2** | Simple pendulum |
| **Week 3** | Surface tension |
| **Week 4** | Speed of sound |
| **Week 5** | Glass refractive index |

| | |
|---|---|
| **Week 6** | diffraction grating |
| **Week 7** | Equilibrium forces |
| **Week 8** | **Midterm exam** |
| **Week 9** | Ohm's law |
| **Week 10** | Viscosity |
| **Week 11** | Wheatstone bridge |
| **Week 12** | inclined plane |
| **Week 13** | Archimedes principle |
| **Week 14** | focal length of the lens |
| **Week 15** | standing waves |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Fundamental of Physics (Halliady, Resnick, and Walker). | Yes |
| **Recommended Texts** | | |
| **Websites** | | |

## Grading Scheme

مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |

| | | | | |
|---|---|---|---|---|
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| **(0 – 49)** | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Democracy and Human Right | | | **Module Delivery** | |
| **Module Type** | Support | | | ☒ **Theory**<br>☐ **Lecture**<br>☐ **Lab**<br>☐ **Tutorial**<br>☐ **Practical**<br>☐ **Seminar** | |
| **Module Code** | UNI-1105 | | | | |
| **ECTS Credits** | 2 | | | | |
| **SWL (hr/sem)** | 50 | | | | |
| **Module Level** | U( | | **Semester of Delivery** | 1 | |
| **Administering Department** | Biotechnology | | **College** | College of Science | |
| **Module Leader** | | | **e-mail** | | |
| **Module Leader's Acad. Title** | Assistant Professor | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | | | **e-mail** | | |
| **Peer Reviewer Name** | | | **e-mail** | | |
| **Scientific Committee Approval Date** | 01/06/2024 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims** | This course deals with the basic concept of human rights& democracy -1<br>Clarifying and training students on the most important principles of human rights -2 |

| | |
|---|---|
| أهداف المادة الدراسية | and democracy.<br>3- Organizing discussions and presentations on the most vital and basic topics affecting community building, related to human rights and democracy..<br>4- Adopting teamwork with students to develop their cognitive abilities and create a spirit of cooperation, initiative, creativity and exchange of views in an effort to build the foundations of peaceful community coexistence.<br>5- Providing society with conscious youth aware of the importance of its role in building society, its unity and cohesion through spreading the culture of human rights and establishing the rules of correct democracy<br>6- Human rights guarantee the protection and respect of an individual's interests, even when he or she is not a majority. In a democratic climate, sustainable democratic power cannot be conceived without respecting, protecting and fulfilling human rights. Through their combined influence, they allow the individual a life based on the freedom of self-determination and collective. That is why the protection and realization of human rights truly form the basis of the democratic project. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | **Cognitive goals.**<br>1- Educate students and inform them about the importance of human rights and democracy.<br>2- Recognize and understand the methods of teamwork for the exchange of ideas and creative discussions<br>3- Developing students' performance through guidance in preparing mini-research on modern vocabulary on vital topics related to human rights and democracy.<br>4- Providing students with creative development abilities in modern proposals and creative developmental ideas by discussing awareness videos presented on electronic classes.<br>5- Developing the skills of sharing opinions and ideas and respecting others opinion.<br>**Objective Skills :**<br>1- Basic knowledge in the principles of human rights and democracy.<br>Building the innovative personality of knowledge through onlineresearch and the transfer and exchange of information.<br>2- Discuss the various properties about everything related to humanrights and their importance in our daily lives.<br>3- Identify everything related to democracy and the foundations ofthe performance of the electoral process and its importance in building the nation.<br>4- Identify the capacitor and inductor phasor relationship withrespect to voltage and current |
| **Indicative Contents**<br>المحتويات الإرشادية | • Developing the student's analytical and critical skills regarding the reality and future of human rights and democracy<br>• Training the student on the importance of active participation in aspects of public life, such as promoting respect for the principles of public human rights and active participation in political and cultural life. |

| | |
|---|---|
| | • Enable students to understand the importance of education and its role in spreading the culture of human rights and democracy in building a civilized society based on good governance, the most important component of which is belief in human rights, education and active participation in governance through free and fair elections |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | The main strategy that will be adopted in delivering this module is to encourage students' participation in the discussions, dialogues and group work lectures & exercises, while at the same time refining and expanding their critical thinking skills. There are many teaching and learning methods used, and the most important of these methods are: Theoretical lecture, discussion and dialogue, panel discussions on certain topics, theoretical student research<br>Library and electronic activities (which helps students to reach the following results:<br>**-1** The scientific ability to distinguish between correct information and wrong information.<br>**-2** Ease of scientific drafting and ease of correction.<br>**-3** Ability to memorize and guess.<br>**-4** The ability to link concepts and principles with reality.<br>**-5** Ability to invoke, link, interpret. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 33 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 2.2 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 17 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 1.13 |
| **Total SWL (h/sem)** | 50 | | |

| | |
|---|---|
| الحمل الدراسي الكلي للطالب خلال الفصل | |

## Module Evaluation
تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| Formative assessment | Quizzes | 2 | 10% (10) | 5, 10 | LO #1, 2, 10 and 11 |
| | Assignments | 2 | 10% (10) | 2, 12 | LO # 3, 4, 6 and 7 |
| | Attending lectures | 1 | 1% | 1.5 | 41#15 weeks |
| | Report | 1 | 10% (10) | 13 | LO # 5, 9 and 10 |
| Summative assessment | Midterm Exam | 2 hr | 10% (10) | 8 | LO # 1-7 |
| | Final Exam | 2hr | 50% (50) | 16 | All |
| Total assessment | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| Week 1 | Familiarity with the concept of human rights and the definitions approaching it, discussing, dismantling and criticizing them in a scientific way in order to reach the most accurate and objective. - Definition of right , of human, of the concept ofhuman rights. Human Rights Human rights qualities, Types of human rights Categories |
| Week 2 | The historical development of human rights: Orcagina Reforms 1- Urnamo Law.2- The law of Ishtar Bit. 3- The law of the Kingdom of Eshnuna.4- Code ofHammurabi. |
| Week 3 | Human rights in other ancient civilizations: 1- Indian and Chinese civilization 2- 4- Roman civilization Pharaonic civilization of Egypt 3- Greek civilization |

| | |
|---|---|
| **Week 4** | Human rights in heavenly laws<br>Human Rights in Judaism, Human rights in Christianity, Human Rights in Islam. |
| **Week 5** | Human rights in Renaissance - modern and contemporary societies<br>Introducing the student to the most important UN document in the field of humanrights, which was approved and approved by the Assembly on January 10, 1948 Universal Declaration of Human Rights 1948. |
| **Week 6** | Non-governmental organizations defending human rights: Amnesty International, b. International Committee of the Red Cross. Arab Organization for Human Rights. |
| **Week 7** | Definition of the phenomenon of administrative corruption, Types of administrative corruption, Causes of administrative corruption. The repercussions of the phenomenon of administrative corruption on human rights and society. Successful treatments to combat corruption and protect society fromit. |
| **Week 8** | Introduction - Historical development of the concept of democracy, definition of democracy, freedom. The difference between freedom and democracy, The relationship between the rights and public freedoms of individuals and democracy, Islamic views in a democratic system of government , Shura and Democratic System |
| **Week 9** | Specifications and duties of the Islamic ruler reading, The era of Imam Ali "peace be upon him" to his governor over Egypt: Specifications of the Islamic ruler: First:The moral and doctrinal components of the ruler Second: The general culture of the Islamic ruler, Third: Acumen and good choice: -Fourth: Direct relationship with people: Fourth: Direct relationship with people.<br>Duties of the Islamic ruler:<br>First: Social Reform: Second: Achieving security and defense Third: The architecture of the country "economic development" |
| **Week 10** | Forms of democracy: (1): Direct democracy ,(2): Semi-direct democracy , (3): Parliamentary democracy (parliamentary representation)4): LiberalDemocracy (5): consociation Democracy, (6): Delegated Democracy. |
| **Week 11** | Conditions for the success of the elements and pillars of the democratic system General conditions for the success of the democratic system: 1. Respect for humanrights, 2. Political pluralism 3. Peaceful transfer of power 4. Political equality 5. Respect the principle of the majority 6. Existence of the rule of law. |
| **Week 12** | Components or elements of democracy:<br>1 – Citizenship 2- Political participation 3. Elections 4. MPs and Responsibility 5. Opposition 6- Separation of government and parliament 7- Constitutional legitimacy |
| **Week 13** | The concept of elections and their legal adaptation: First: The concept of electionSecond: Legal adaptation of the Election, Third: Conditions of Election, Fourth: Concepts of Elections, Fifth: Types of Electoral Systems. Assessing the DemocraticSystem, Pros and advantages of the democratic system, Disadvantages and disadvantages of the democratic system, Implementing the democratic system in Iraq. |
| **Week 14** | Third: Lobbyists: First: the concept and definition. Second: Types of pressure groups. Themethods of pressure groups that they use to achieve their goals.<br>Fourth: Lobbying and Democracy. |

| | |
|---|---|
| **Week 15** | Final Exam |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Martyrdom verses from the Holy Quran<br>Mohammed Al-Tarawneh et al., International Humanitarian Law, ICRC, Amman, 2005<br>Diamond Larry, Democracy: Its Development and Ways to Enhance It, translated by Fawzia Naji, Dar Al-Mamoun for Translation, Iraq, 2005. | Yes |
| **Recommended Texts** | journal.un.org<br>Hadi, Riad Azabz. (2005). Human rights (evolvingcontents and protection) (Baghdad). | Yes |
| **Websites** | Universal Declaration of Human Rights \| United Nations<br>https://sc.uobaghdad.edu.iq/?page_id=8415<br>https://www.youtube.com/@ansamalobidimanagerofhuman2891 | |

## Grading Scheme

مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة

| Module Information<br>معلومات المادة الدراسية | | | | |
|---|---|---|---|---|
| **Module Title** | English Language | | **Module Delivery** | |
| **Module Type** | Support | | ☒ **Theory**<br>☐ **Lecture**<br>☐ **Lab**<br>☐ **Tutorial**<br>☐ **Practical**<br>☐ **Seminar** | |
| **Module Code** | UNI-1106 | | | |
| **ECTS Credits** | 2 | | | |
| **SWL (hr/sem)** | 50 | | | |
| **Module Level** | U( | | **Semester of Delivery** | 1 |
| **Administering Department** | Biotechnology | | **College** | College of Science |
| **Module Leader** | Shaymaa Hatam Abdulla | | **e-mail** | shaymaa@uodiyala.edu.iq |

| | | | |
|---|---|---|---|
| **Module Leader's Acad. Title** | Assistant Professor | **Module Leader's Qualification** | Ph.D. |
| **Module Tutor** | | **e-mail** | |
| **Peer Reviewer Name** | | **e-mail** | |
| **Scientific Committee Approval Date** | 01/06/2023 | **Version Number** | 1.0 |

## Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

| | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

**Module Aims**

أهداف المادة الدراسية

New Headway Beginner Plus is a Beginner course in English intended to provide students with the fundamentals of the language and a foundation at First Year students / college of science, moving towards a higher level of proficiency at this stage.

1. Listening Objectives:
- Understand and respond to basic greetings, introductions, and simple instructions.
- Comprehend and extract information from short, simple spoken passages related to everyday topics.
- Identify and understand common vocabulary and expressions in spoken English.

2. Speaking Objectives:
- Engage in basic conversations using simple greetings, introductions, and expressions related to personal information.
- Ask and answer simple questions about personal details, daily routines, and familiar topics.
- Participate in short dialogues and role-plays to practice communication skills.

3. Reading Objectives:
- Read and comprehend simple texts, such as signs, labels, short passages, and dialogues.
- Recognize and understand basic vocabulary words and phrases in context.
- Extract information from texts related to everyday situations and topics.

| | |
|---|---|
| | 4. Writing Objectives:<br>• Write short sentences and paragraphs about personal information, experiences, and familiar topics.<br>• Fill out basic forms with personal details, such as name, age, and nationality.<br>• Write simple messages, notes, and emails related to everyday situations.<br>5. Vocabulary and Grammar Objectives:<br>• Acquire a basic vocabulary related to common topics, such as greetings, numbers, time, family, food, and everyday objects.<br>• Understand and use basic grammatical structures, including present simple, present continuous, simple past, and basic question forms.<br>• Recognize and use common prepositions, articles, and basic sentence structures.<br>6. Cultural Awareness Objectives:<br>• Develop an understanding of cultural customs and practices related to greetings, social norms, and everyday interactions in English-speaking countries.<br>Gain exposure to cultural elements through reading or listening to texts about customs, traditions, and holidays. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | By the end of the course, the students will be able to:<br>1. Listening and Speaking Skills:<br>• Understand and respond appropriately to basic questions and statements.<br>• Engage in simple conversations related to personal information, daily routines, and immediate surroundings.<br>• Follow simple instructions and directions.<br>• Develop basic pronunciation and intonation skills.<br>2. Reading Skills:<br>• Recognize and understand basic vocabulary words and phrases in simple texts.<br>• Comprehend and extract information from short, simple texts such as signs, notices, and labels.<br>• Understand basic sentence structures and common grammatical patterns.<br>3. Writing Skills:<br>• Write simple sentences and short paragraphs about personal information, experiences, and familiar topics.<br>• Fill out simple forms and write basic personal information.<br>• Write simple messages, notes, and emails related to everyday situations.<br>4. Vocabulary and Grammar:<br>• Acquire and use a basic range of vocabulary related to everyday topics, such as greetings, numbers, time, family, food, and common objects.<br>• Understand and use basic grammatical structures, including present simple, |

| | |
|---|---|
| | present continuous, simple past, and basic question forms.<br>• Recognize and use common prepositions, articles, and basic sentence structures.<br>5. Cultural Awareness:<br>• Develop an understanding of cultural customs and practices related to greetings, social norms, and everyday interactions in English-speaking countries.<br>• Gain exposure to cultural elements through reading or listening to texts about customs, traditions, and holidays. |
| **Indicative Contents**<br>المحتويات الإرشادية | -1 Use simple forms of polite expressions to establish basic social contact and to perform everyday functions including making requests and offers, conducting simple phone conversations, asking and telling time, giving simple directions, asking about price, ordering a meal, etc.<br>-2 Use a narrow range of positive and negative adjectives to describe objects, people and places.<br>-3 Exchange information by forming and responding to simple questions.<br>-4 Produce simple sentences using the correct word order and punctuation marks.<br>-5 Use capital and lower case letters accurately in writing.<br>-6 Construct a short guided paragraph on a familiar topic concerning home, family, friends and holidays.<br>-7 Use the basic tenses including the present and past simple, a present continuous correctly.<br>-8 Use the basic auxiliary verbs (am/is/are/was/were/can) and a range of regularand irregular verbs.<br>-9 Demonstrate awareness of the essential grammatical features and functions including questions and negatives, plural nouns, frequency adverbs, possessives, pronouns and determiners. |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | **.1** Communicative Approach: Emphasize communicative activities that promote interaction among students. Encourage pair and group work, role-plays, and discussions to practice language skills in meaningful contexts.<br>**.2** Integrated Skills: Integrate the four language skills (speaking, listening, reading, and writing) in lessons to create a balanced approach to language learning. Provide opportunities for students to use and develop these skills simultaneously.<br>**.3** Vocabulary Expansion: Incorporate vocabulary-building exercises and activities throughout the course. Use real-life contexts, visuals, and practical examples to help students learn and remember new words. |

| | |
|---|---|
| | 4. Grammar Focus: Teach and reinforce grammar structures in a systematic and progressive manner. Provide clear explanations, examples, and practice exercises to ensure students understand and can apply the grammar rules correctly.<br><br>5. Authentic Materials: Include authentic texts, such as articles, newspaper clippings, songs, and videos, to expose students to real-world language usage. This helps develop their reading and listening comprehension skills and exposes them to cultural aspects of English-speaking countries.<br><br>6. Cultural Awareness: Integrate cultural topics and discussions into the lessons to foster cultural awareness and sensitivity. Encourage students to share their own cultural backgrounds and experiences to promote understanding and appreciation of diverse perspectives.<br><br>7. Error Correction: Provide constructive feedback and error correction during speaking and writing activities. Help students identify and correct their mistakes, focusing on accuracy while encouraging fluency and self-expression.<br><br>8. Technology Integration: Utilize technology tools, such as interactive whiteboards, online resources, and language learning apps, to engage students and enhance their language learning experience. Incorporate multimedia materials for listening and speaking practice.<br><br>9. Regular Assessment: Assess students' progress regularly through quizzes, tests, and assignments. Provide timely feedback to guide their learning and address areas that need improvement.<br><br>10. Individualization: Cater to the individual needs and learning styles of students. Offer differentiated tasks and activities to ensure all learners are appropriately challenged and supported.<br><br>11. Cooperative Learning: Promote collaboration and teamwork among students through pair work, group projects, and peer feedback. This encourages active participation and a supportive learning environment.<br><br>12. Review and Revision: Schedule regular review sessions to consolidate previously learned material. Encourage students to revise and practice independently, providing resources for self-study and additional practice. |

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)** | 33 | **Structured SWL (h/w)** | 2.2 |

| | | | |
|---|---|---|---|
| | الحمل الدراسي المنتظم للطالب أسبوعيا | | الحمل الدراسي المنتظم للطالب خلال الفصل |
| 1.13 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 17 | **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل |
| 50 | | | **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل |

## Module Evaluation
تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 2, 10 and 11 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4, 6 and 7 |
| | **Attending lectures** | 1 | 1% | 1.5 | 41#15 weeks |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 9 and 10 |
| **Summative assessment** | **Midterm Exam** | 2 hr | 10% (10) | 8 | LO # 1-7 |
| | **Final Exam** | 3hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| **Week 1** | General introduction and the rules of how to speak English fluently? |
| **Week 2** | Week 2 Present simple and continuous tense. |
| **Week 3** | Week 3 Present perfect tense and its applications. |
| **Week 4** | Week 4 Past simple and continuous tense. |

| | |
|---|---|
| **Week 5** | Week 5 Past perfect tense and its applications. |
| **Week 6** | Week 6 Future simple and continuous tense. |
| **Week 7** | Week 7 Future perfect tense and its applications. |
| **Week 8** | Week 8 Auxiliary verbs |
| **Week 9** | Week 9 Prepositions |
| **Week 10** | Week 10 Irregular Verbs |
| **Week 11** | Week 11 Capitalization rules |
| **Week 12** | Week 12 Formal sentences and Informal sentences. |
| **Week 13** | Week 13 Narrative tenses |
| **Week 14** | Week 14 The Growing Popularity of Organic Food |
| **Week 15** | Week 15 Collective Wisdom of Ants |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | **Text** | **Available in the Library?** |
|---|---|---|
| **Required Texts** | Soars, John and Liz, (2011), New Headway Plus, SpecialEdition, Beginner Level, Oxford University Press. | Yes |
| **Recommended Texts** | New Headway Plus provides an integrated skills course with each unit divided into grammar, vocabulary, skills work andeveryday English segments | Yes |
| **Websites** | Oxford University Press: The New Headway series is published by Oxford University Press. Visit their website at www.oup.com and search for "New Headway Plus, Special Edition, Beginner Level " or browse their English language teaching section for information on the course. | |

## Grading Scheme

مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| Success Group (50 - 100) | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| Fail Group (0 – 49) | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# Semester TWO

MODULE DESCRIPTION FORM

نموذج وصف المادة

## Module Information
معلومات المادة الدراسية

| | | | |
|---|---|---|---|
| **Module Title** | Principle of Biotechnology **2** | **Module Delivery** | |
| **Module Type** | Core | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar | |
| **Module Code** | 072BIOT-1 | | |
| **ECTS Credits** | 7 | | |
| **SWL (hr/sem)** | 175 | | |
| **Module Level** | U( | **Semester of Delivery** | 2 |
| **Administering Department** | Biotechnology | **College** | College of Science |
| **Module Leader** | Ziyad Kalouf Radeef | e-mail | zeyadkh.radeef@uodiyala.edu.iq |
| **Module Leader's Acad. Title** | Assistant Professor | **Module Leader's Qualification** | Ph.D. |
| **Module Tutor** | | **e-mail** | |
| **Peer Reviewer Name** | | **e-mail** | |
| **Scientific Committee Approval Date** | 01/06/2023 | **Version Number** | 1.0 |

## Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

| | | | |
|---|---|---|---|
| **Prerequisite module** | Principles of Biotechnology | **Semester** | 1 |
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

| | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | -1 To enable students to obtain knowledge and understanding the intellectual framwok, foundations and applications of biotechnology<br>-2 To enable students to obtain knowledge and understanding of industrial, |

| | |
|---|---|
| | environment and food microbiology.<br>-3 To enable students to obtain knowledge and understanding of genetics, genetic engineering and cytogenetics<br>-4 To enable students to obtain knowledge and understanding botany andanimal tissues.<br>-5 To enable students to obtain knowledge and understanding of cytology and microbiology<br>-6 Found a mental and applications of biotechnology<br>-7 Isolation, purification and treatment of various biological molecules |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | -1 Preparing specialists familiar with the basis of biotechnology (theoretically and practically) who are able to meet the needs of the labor market.<br>-2 Conduction scientific research and trying to keep with the scientific development of biotechnologies.<br>-3 Cooperate with state institution and the private sector by providing scientific consultation laboratory analysis in the fields of genetic, environment, industrial microbiology engineering.<br>-4 Encourage scientific research and providing students with basic skill in biotechnologies and their applications in all fields.<br>-5 Encourage the staff to participate in scientific forums inside and outside the country.<br>**-6** Contribute to solve scientific problems in order to serve the national development planks. |
| **Indicative Contents**<br>المحتويات الإرشادية | -1 Genetics and Biotechnology Evolutionary stages of biotechnologies<br>-2 Mutation<br>-3 Methods of transmitting genetic material (gene)<br>-4 Antibiotics<br>-5 Enzyme production<br>-6 Immobilization of Enzyme<br>-7 Solid-state fermentations<br>-8 Separation of biological products<br>-9 Bioseparation (purification of biomaterials)<br>-10 The relationship between the environment and biotechnologies |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Teaching students the basic foundations and principles of biotechnology related to the various directions of this field of knowledge in the sciences of industrial fermentation, genetic engineering, bioseparation, and how to exploit microbial, plant and animal cells in the production of materials of industrial or medical value to the consumer. |

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا | 6.26 | **Structured SWL (h/sem)** الحمل الدراسي المنتظم للطالب خلال الفصل | 94 |
| **Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5.4 | **Unstructured SWL (h/sem)** الحمل الدراسي غير المنتظم للطالب خلال الفصل | 81 |
| | | **Total SWL (h/sem)** الحمل الدراسي الكلي للطالب خلال الفصل | 175 |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 2, 4 and 6 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4 and 6 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 6 |
| **Summative assessment** | **Midterm Exam** | 2 hr | 10% (10) | 8 | LO # 1-7 |
| | **Final Exam** | 2hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| **Week 1** | The concept of genetics, genetic engineering and categorical enzymes |
| **Week 2** | The concept of mutagenication types of physical and chemical mutagens |
| **Week 3** | Conjugation, phage transport and DNA manipulation technology |
| **Week 4** | The concept of antibiotics and microorganisms used in production |
| **Week 5** | First exam |
| **Week 6** | The concept of enzymes and microorganisms producing enzymes and their industrial and medical applications, Industrial production of enzymes |
| **Week 7** | The concept of restriction Enzyme restriction methods and their use |
| **Week 8** | MID EXAM |
| **Week 9** | The concept of solid state fermentations Microbiology feedstock used in SCP |
| **Week 10** | The concept of bioseparation and methods used in the extraction of biological materials |
| **Week 11** | Precipitation with ammonium sulfate, alcohol and other methods |
| **Week 12** | Ion exchange Chromatography, gel filtration Chromatography and affinity Chromatography |
| **Week 13** | Second exam |
| **Week 14** | The concept of biological control and microorganisms used |
| **Week 15** | The concept of mining microorganisms used |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

| | Material Covered |
|---|---|
| **Week 1** | Lab 1: The Roles of Enzymes in Biotechnology |
| **Week 2** | The Roles of Enzymes in Biotechnology (practically) |

| | |
|---|---|
| **Week 3** | Lab 2: Enzyme purification by ammonium sulfate precipitation |
| **Week 4** | Enzyme purification by ammonium sulfate precipitation (practically) |
| **Week 5** | Lab 3: Immobilization of Enzymes |
| **Week 6** | Immobilization of Enzymes (practically) |
| **Week 7** | Lab 4: Production of Single cell protein from yeast |
| **Week 8** | Production of Single cell protein from yeast (practically) |
| **Week 9** | Lab 5: Antibacterial Activity of Ginger (*Zingiber Officinale*) Extract |
| **Week 10** | Antibacterial Activity of Ginger (*Zingiber Officinale*) Extract (practically) |
| **Week 11** | Lab 6: Solid state fermentation (SSF) |
| **Week 12** | Solid state fermentation (SSF) (practically) |
| **Week 13** | Lab 7: What is a restriction enzyme? |
| **Week 14** | What is a restriction enzyme? (practically) |
| **Week 15** | Final Exam |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | **Text** | **Available in the Library?** |
|---|---|---|
| **Required Texts** | Microbiology and Biotechnology (2001) -1<br>A Text book of Biotechnology(2006) -2 | Yes |
| **Recommended Texts** | Methods in Biotechnology (1997)-1<br>Biotechnology, Principles and Application (1988) -2 | Yes |
| **Websites** | https://books.google.iq/books?id=K7kLyFX_qtUC&printsec=frontcover&source=gbs_g<br>e_summary_r&cad=0#v=onepage&q&f=false | |

## Grading Scheme

مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة

| Module Information<br>معلومات المادة الدراسية | | | |
|---|---|---|---|
| **Module Title** | General Biology **2** | **Module Delivery** | |
| **Module Type** | Core | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar | |
| **Module Code** | BIOT-1208 | | |
| **ECTS Credits** | 7 | | |
| **SWL (hr/sem)** | 175 | | |
| **Module Level** | U( | **Semester of Delivery** | 2 |
| **Administering Department** | Biotechnology | **College** | College of Science |
| **Module Leader** | Alyaa Maan Abd Alhameed | **e-mail** | alyaa.maen@uodiyala.edu.iq |
| **Module Leader's Acad. Title** | sProfessor | **Module Leader's Qualification** | Ph.D. |
| **Module Tutor** | | **e-mail** | |
| **Peer Reviewer Name** | | **e-mail** | |
| **Scientific Committee Approval Date** | 01/06/2024 | **Version Number** | 1.0 |

## Relation with other Modules

| العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Principles of Biotechnology | **Semester** | 1 |
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

| | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | This course deals with the basic concept of Zoology. .1<br>To understand the role of Zoology in the Biotechnology field. .2 |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | **.1 To know the general information about Zoology and its branches.**<br>**.2 Recognize the classification systems of the animal kingdom, and the main divisions and characteristics of each division and class with examples**<br>**.3 To understand the chemistry of life the components including lipids, and carbohydrates.**<br>**.4 To understand the chemistry of life the components including protein, and nucleic acid.**<br>**.5 To understand the animal cell structure and functions such as cell membrane, cytoplasm, mitochondria, and endoplasmic reticulum.**<br>**.6 To understand the animal cell structure and functions such as the nucleus, Golgi apparatus, cilia and flagella, centrioles, and cytoskeleton.**<br>**.7 To have knowledge about the main technique for an animal transport system.**<br>**.8 To know cell signaling and communication.**<br>**.9 Understanding the cell division including mitosis and meiosis.**<br>**.10 To understand some cell functions such as the Cellular Respiration**<br>**.11 Study animal disruption, revolution, and development.**<br>**.12 The evolutionary history of biological diversity Phylogenetic tree**<br>**.13 To understand the function of some organs in the animal system, for example, the digestive system.**<br>**.14 Recognize how animal cells can play a very important role in biotechnology.**<br>**.15 Recognize how animal models can play a very important role in biotechnology such as the production of biomaterials and other applications** |
| **Indicative Contents** | Indicative content includes the following:-<br>-1 Introduction, Zoology classification systems, How animal cells differ from |

| | |
|---|---|
| المحتويات الإرشادية | plant,Morphology of fungi, Reproduction<br>-2 Important of fungi, Living mode of fungi, Cultivation of fungi, sexual and asexualreproduction in fungi.<br>-3 Classification of fungi, Division 1: Myxomycota, general characteristics, the classes involved in this division. (One example for each class).<br>-4 Division 2: Eumycota , general characteristics, Class 1,Chytridiomycetes and its classification, Class 2, Hyphochytridiomyctes.<br>-5 Division 2: Eumycota, Class 3: Oomyctes , general characteristics, and the classification of this class.<br>-6 Division 2: Eumycota, Class 4: Zygomycetes, general characteristics, Orders involved in this class. The role of some strains in production of biomaterials.<br>-7 Division 2: Eumycota, Class 5: Ascomycetes, general characteristics, Subclasses involved in this class. The role of some strains in production of biomaterials, food manufacturing, plant pathogens, Human pathogens.<br>-8 Division 2: Eumycota, Class 6: Basidimycetes, general chracteristics, Subclasses involved in this class. The role of some strains in production of enzymes such laccase, peroxidase, cellulose, Edible and poising mushroom.<br>-9 Division 2: Eumycota, Class 7: Deutromycetes, general chracteristics, Subclasses involved in this class.<br>-10 Medical mycology Mycotoxins |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

| | |
|---|---|
| **Strategies** | The main strategy that will be adopted in delivering this module is to encourage students' participation in the collection of different samples, media preparation. Isolation and primitive identification according to the acquired skills from the theoretical and practical information through lectures and Lab. |

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 94 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 6.26 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 81 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5.4 |
| **Total SWL (h/sem)** | 175 | | |

| | |
|---|---|
| الحمل الدراسي الكلي للطالب خلال الفصل | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| Formative assessment | Quizzes | 2 | 10% (10) | 5, 10 | LO #1, 2, 4 and 6 |
| | Assignments | 2 | 10% (10) | 2, 12 | LO # 3, 4 and 6 |
| | Projects / Lab. | 1 | 10% (10) | Continuous | All |
| | Report | 1 | 10% (10) | 13 | LO # 5, 8 and 6 |
| Summative assessment | Midterm Exam | 2 hr | 10% (10) | 8 | LO # 1-7 |
| | Final Exam | 2hr | 50% (50) | 16 | All |
| Total assessment | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| Week 1 | Introduction, branches such as morphology, histology, cytology, physiology, genetics, ecology, and taxonomy |
| Week 2 | Classification of Zoology including kingdom, phylum, class, order, family, genus, and species. |
| Week 3 | Study the chemistry of life such as macromolecules and carbohydrates and lipids. |
| Week 4 | Study the chemistry of life such as the structure and function of proteins and the structure of nucleic acid, DNA and RNA, the type of RNA. |
| Week 5 | Cell membrane structure and components, cytoplasm, the cytoplasm structure, mitochondria and endoplasm reticulum |

| | |
|---|---|
| **Week 6** | Structure and function of cells such as of nucleus, Golgi apparatus, cilia, and flagella,centrioles, and cytoskeleton. |
| **Week 7** | Midterm exam |
| **Week 8** | Transport system in animals: cell -Plasma Membrane Functions,-Diffusion, Osmosis, Facilitated transport, Active transport, Endocytosis, and Exocytosis |
| **Week 9** | Type of cell signal, a cascade of signaling events, relay, integration and distribution of signal transducer, signaling pathways regulator and cellular function |
| **Week 10** | Mitosis and meiosis, prophase, metaphase, anaphase, telophase, the function of mitosis, development and growth, cell replacement, regeneration, meiosis I meiosis II. |
| **Week 11** | Study animal disruption, revolution, and development. Source of variation, modern synthesis, anatomy, fossils, direct observation, analogy, morphology, natural selection,population |
| **Week 12** | Phylogenetic tree, protist, protozoa, Protophyta, Molds. |
| **Week 13** | Animal cell application, gene therapy, drug screening, production of vaccine, production of therapeutic protein |
| **Week 14** | Animal model: drug pharmacological, disease resistance models, mutation induced models, stress induced model |
| **Week 15** | Final exam |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

| | **Material Covered** |
|---|---|
| **Week 1** | Lab 1: Introduction |
| **Week 2** | Lab 2: -Microscope Parts and functions |
| **Week 3** | Lab 3: Functions of cell membrane-Composition of cell membrane. |
| **Week 4** | Lab 4: Methods of transport across membranes, Diffusion, Osmosis, Facilitated transport, Aactive transport, Endocytosis and Exocytosis |
| **Week 5** | Lab 5: The stages of mitosis, Why use onion roots for viewing mitosis? Viewing Chromosomes |
| **Week 6** | Lab 6: cell respiration |

| | |
|---|---|
| **Week 7** | Lab 7: Phylogenetic tree, protist, protozoa, Protophyta, Molds. |
| **Week 8** | Lab 8: Animal cell application, gene therapy, drug screening, production of vaccine, production of therapeutic protein |
| **Week 9** | Lab 9: Animal model: drug pharmacological, disease resistance models, mutation induced models, stress induced model |
| **Week 10** | Lab 10: final exam |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | **Text** | **Available in the Library?** |
|---|---|---|
| **Required Texts** | M. Koto-The. Biology of biodiversity-Springer -1<br>E.O. Wilson-Biodiversity-Academic Press -2 Washington.<br>G.G.-Simpson-Principle of animal taxonomy -3 OxfordIBH Publication company. | Yes |
| **Recommended Texts** | Skoal R.R. and F.J.Rohiff Biometry-Freeman, San-Francisco | Yes |
| **Websites** | https://www.khanacademy.org/science/biology | |

## Grading Scheme

مخطط الدرجات

| **Group** | **Grade** | التقدير | **Marks (%)** | **Definition** |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |

| | | | | |
|---|---|---|---|---|
| **Fail Group** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| **(0 – 49)** | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM
# نموذج وصف المادة الدراسية

| **Module Information**<br>معلومات المادة الدراسية | | |
|---|---|---|
| **Module Title** | Organic chemistry | **Module Delivery** |
| **Module Type** | **Core** | **☒ Theory**<br>**☒ Lecture** |

| | | | | |
|---|---|---|---|---|
| **Module Code** | **BIOT-1209** | | | ☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☐ Seminar |
| **ECTS Credits** | **7** | | | |
| **SWL (hr/Sem)** | **175** | | | |
| **Module Level** | UG | **Semester of Delivery** | | 2 |
| **Administering Department** | Chemistry | **College** | | College of Science |
| **Module Leader** | Mohamed Jabar Mohamed | **e-mail** | | mohammedjabbar0908@gmail.com |
| **Module Leader's Acad. Title** | Assistance Professor | **Module Leader's Qualification** | | Ph.D. |
| **Module Tutor** | | **e-mail** | | E-mail |
| **Peer Reviewer Name** | Name | **e-mail** | | E-mail |
| **Scientific Committee Approval Date** | 01/06/2023 | **Version Number** | | |

| **Relation with other Modules**<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

| | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | This module aims to provide a good foundation to the students in Organic Chemistry. It teaches fundamental chemical ideas in the framework of Organic Chemistry and begins to build the more specialized understanding of organic processes needed for following modules.<br>This module will be included the main points:<br>1. Basic principles of organic chemistry for predicting the atom and electronic structure of molecules, their stability, reactivity, and molecular characteristics including bond types and hybridization.<br>2. Know the organic compounds naming and categorization.<br>3. Through lectures, workshops, tutorials, and seminars, the students will learn more |

| | |
|---|---|
| | about organic chemistry and understand it better. This course will give them the confidence to talk about the path of simple processes using the language of organic chemistry. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | **According to the delivery plan , the students who successfully complete the organic chemistry 2 module will be able to:**<br>**.1 Predict and explain the expected chemical and physical behavior of an organic compound based on its functional groups and geometry. Identify the electronic configuration of elements atomic and molecular orbitals, especially carbon atoms. Study the types of bonds between elements and the hybridization types of atoms. Recognize the structural isomers, molecular formula, melting points and boiling points.**<br>**.2 Recognize the hydrocarbons generally, and then study All organic compounds are derived from the hydrocarbons because they are made up of only hydrogen and carbon. On the basis of structure, hydrocarbons are divided into two main classes—aliphatic and aromatic. Aliphatic hydrocarbons do not contain the benzene group, or the benzene ring, whereas aromatic hydrocarbons contain one or more benzene rings.**<br>**.3 Preparation of alkanes and Cycloalkanes: Hydrogenation, Reduction of alkyl halides, Coupling of alkyl halides with organometallic compounds.**<br>**.4 Studying structure and shape of alkenes, Geometric Isomers, Nomenclature, preparations, Dehydrohalogenation of alkyl halides, Dehydration of alcohols, Dehalogenation of vicinal dihalides, Reduction of alkynes.**<br>**.5 Reactions of the carbon-carbon double bond: ADDITION REACTIONS, Catalytic hydrogenation, Addition of halogens, Hydroxylation. Glycol formation, Addition of hydrogen halides, Addition of sulfuric acid, Polymerization.**<br>**.6 Structure and Bonding in Alkynes, Nomenclature, Preparations, Dehydrohalogenation of alkyl dihalides, Dehalogenation of tetrahalides, Reaction of sodium acetylides with primary alkyl halides, Reactions of Alkynes.**<br>**.7 Nomenclature of Benzene Derivatives, Monosubstituted Benzenes, Disubstituted Benzenes, Polysubstituted Benzenes, reactions of benzene: Electrophilic Aromatic Substitution.**<br>**.8 Effect of substituent groups on benzene (Activating and Deactivating groups), Bromination, Nitration etc.** |

| | |
|---|---|
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following.<br>1. Structural isomers and orbital views of bonding; Structure of alkanes;Physical and chemical properties of alkanes, alkenes, and alkynes.<br>2. Terminology, essential ideas, and some basics of organic chemistry.<br>3. Basic reactions of alkanes, alkenes, alkynes, Benzene Derivatives;Reactivity and Orientation Naming and classification of organic compounds. |

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

| **Student Workload (SWL)**<br>الحمل الدراسي للطالب محسوب لـ **15** اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 94 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 6.26 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 81 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5.4 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 175 | | |

| **Module Evaluation**<br>تقييم المادة الدراسية |
|---|

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5 and 10 | LO #1, #2 and #10, #11 |
| | **Assignments** | 2 | 10% (10) | 2 and 12 | LO #3, #4 and #6, #7 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 13 | LO #5, #8 and #10 |
| **Summative assessment** | **Midterm Exam** | 2hr | 10% (10) | 7 | LO #1 - #7 |
| | **Final Exam** | 3hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

| **Delivery Plan (Weekly Syllabus)**<br>المنهاج الاسبوعي النظري | |
|---|---|
| ١ | **Material Covered** |
| **Week 1** | Introduction of organic chemistry |
| **Week 2** | Nomenclature of alkanes |
| **Week 3** | structure and physical properties of alkanes |
| **Week 4** | Reaction of alkanes |
| **Week 5** | Synthesis of alkanes |
| **Week 6** | Nomenclature of alkene, , |
| **Week 7** | structure and physical properties of alkenes |
| **Week 8** | Reaction of alkenes |
| **Week 9** | synthesis,and reactions of alkenes |
| **Week 10** | Nomenclature of alkynes |

| | |
|---|---|
| **Week 11** | structure and physical properties of alkynes |
| **Week 12** | Reaction of alkynes |
| **Week 13** | synthesis,and reactions of alkynes |
| **Week 14** | Aromatic compounds and Aromatic substitution reactions |
| **Week 15** | Aldehydes and ketones |
| **Week 16** | Organic acids |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| **١** | **Material Covered** |
| **Week 1** | Determination of Melting point |
| **Week 2** | Determination of Boiling point |
| **Week 3** | Determination of sublimation |
| **Week 4** | Recrystallization : Purification of crystalline organic compound |
| **Week 5** | Extraction |
| **Week 6** | Distillation |
| **Week 7** | Simple distillation |
| **Week 8** | Fractional distillation |
| **Week 9** | Qualitative characterization of functional groups ( Baeyer ) |
| **Week 10** | Qualitative characterization of functional groups (Tollen) |
| **Week 11** | Qualitative characterization of functional groups (Lucas ) |
| **Week 12** | Qualitative test to defferentiate between type of alcohols (Jones |
| **Week 13** | Qualitative characterization of functional groups ( carbonyl ) |
| **Week 14** | Qualitative characterization of functional groups (haloalkane ) |
| **Week 15** | Qualitative characterization of functional groups ( carboxylic acid ) |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **1** | Organic Chemistry, Morrison and Boyed, 6th ed., 1992, Allyn and Bacon | |
| **2** | Organic Chemistry, Paula Y. Bruice, 6 th ed., 2011 | |
| | | |

| GRADING SCHEME<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **Group** | **Grade** | **التقدير** | **Marks (%)** | **Definition** |
| **Success Group (50 - 100)** | A - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | B - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | C - Good | جيد | 70 - 79 | Sound work with notable errors |
| | D - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | E - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | FX - Fail | راسب - قيد المعالجة | (45-49) | More work required but credit awarded |
| | F - Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

***Note***:
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Computer Skills | | | **Module Delivery** | |
| **Module Type** | Basic | | | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar | |
| **Module Code** | SCI-1211 | | | | |
| **ECTS Credits** | 3 | | | | |
| **SWL (hr/sem)** | 75 | | | | |
| **Module Level** | U( | | **Semester of Delivery** | 2 | |
| **Administering Department** | Computer | | **College** | College of Science | |
| **Module Leader** | | | **e-mail** | | |
| **Module Leader's Acad. Title** | | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | | | **e-mail** | | |
| **Peer Reviewer Name** | | | **e-mail** | | |
| **Scientific Committee Approval Date** | 01/06/2024 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims** | • This module sets out essential concepts and skills relating to the use of devices. |

| | |
|---|---|
| أهداف المادة الدراسية | • This module covers the key skills and main concepts relating to computers, devices, file creation and management, web browsing, and data security.<br>Help students to demonstrate the ability to use word processing formatting, finishing small-sized word processing documents, such as letters and other everyday documents.<br>• Help students to demonstrate the ability to use a power point application to accomplish tasks associated with creating, and formatting a presentation.<br>• Help students to demonstrate the ability to use Excel application to accomplish a spreadsheet for tasks. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Upon successful completion of the course, a student will be able to:<br>.1 Understand key concepts relating to computers, devices and software.<br>.2 Identify the main types of Integrated and External equipment<br>.3 Understand concepts of online communities, communications and e-mail<br>.4 Adjust the main operating system settings and use built-in help features.<br>.5 Know about the main concepts of file management and be able to efficiently organize files and folders.<br>.6 Create a report by Ms. Word document and print an output.<br>.7 Use University email to Collaborate inside and outside university and How to participate in video conference using meet<br>.8 Create a presentation using power point application.<br>**.9** Create a spreadsheet using Excel application. |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following:<br>- The general purpose computer model: All types of computers follow the same structure and perform the basic operations (Input, Processing, Output, Storage and controlling) to converting raw input (data) to information.<br>- Components of a computer Hardware: Each computer consists of Hardware and software. The Hardware includes input devices, output devices, system units, storage devices, and communication devices.<br>- System Units (Internal & External components of system units): The internal component of the system units is consists of (CPU, Motherboard, RAM, Ports, Hard disk …).<br>- Central Processing Unit: ALU, CU, and memory unit.<br>- Memory and its Types<br>▪ Cache Memory<br>▪ Primary memory –Comparison between RAM & ROM<br>▪ Secondary Storage<br>- Ports and their types (Ports: is a connection points used as an interface between the computer and its peripheral devices (Serial ports, Parallel ports, PS/2, USB, VGA …)).<br>- Input Devices (Keyboard, Mouse, …)<br>- Output Devices (Printer, speaker, monitors, …) |

| | |
|---|---|
| | Software -<br>Types of Software<br>▪ Operating System (Windows, Linux, …)<br>▪ Application Software & their types<br>▪ Programming Languages (Low, Assembly, High level).<br>Internet, Benefits, Browsing the Web (Web Browser) , Search the web (search<br>- Communication Technology: It plays an important role in almost every activity that we performed. The best examples of Communication technology includes:blogs, Web sites, live video, social media technology, and E-mail communication.<br>- E-mail: free e-mail providers (G-mail, Yahoo-mail, …), send and receive E-mailoperation, send e-mail with attachment, checking the e-mail boxes (inbox, sendbox, spam …).<br><br>- Security and keeping information safe: protect the information from unauthorized access and prevent use, modification, and destruction of thisinformation.<br>- Virus transmission ways to the computer: by e-mail, Downloading from the Internet, Pirated software, Exchange of diskettes, in attached e-mail, and indocuments.<br>- Protection against viruses: install good anti-viruses.<br>- Antivirus, benefits and Types<br><br>Introduction to windows<br>- Desktop Components: (Icons, Start, task bar …)<br>- The start menu (its functions and properties)<br>▪ |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | 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. Different forms of teaching will be used to reach the objective of this module, including power point presentation for the subjects which contains titles, definitions, summary and conclusions, whiteboard will be used and classroom discussion with assignments, the students will be asked to prepare papers on selective topics. |

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 49 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 3.26 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 26 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 1.73 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 75 | | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 2, 4 and 6 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4 and 6 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 6 |
| **Summative assessment** | **Midterm Exam** | 2 hr | 10% (10) | 8 | LO # 1-7 |
| | **Final Exam** | 2hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | **Material Covered** |
|---|---|
| **Week 1** | Introduction to Computers – definition<br>-The purposes of using a computer.<br>-The general purpose computer model.<br>-The difference between Data and Information concepts.Introduction to windows<br>Desktop Components -<br>The start menu (its functions and properties) - |
| **Week 2** | The Components of a computer: Hardware<br>System Units (Internal & External components of system units) -<br>Central Processing Unit (Features and components)Windows: -<br>Task bar and its functions and properties - |
| **Week 3** | Memory and its Types -<br>▪ Cache Memory<br>▪ Primary memory –Comparison between RAM & ROM<br>▪ Secondary StorageWindows:<br>Files and Folders: All operations on files and folders (selection, creation, saving, moving andrenaming). - |
| **Week 4** | Ports and their types<br>Input Devices, -<br>Output Devices -<br>Windows:<br>Delete Files. -<br>Recycle bin. -<br>Creating a Shortcut. -<br>Desktop Icons. -<br>The Windows Explorer Views. -<br>Sort files. - |
| **Week 5** | - Software<br>Types of Software<br>▪ Operating System<br>▪ Application Software & their typesProgramming Languages<br>Windows:<br>-Customizing the desktop.<br>-Change screen resolution.<br>- Change Desktop Background |
| **Week 6** | Communication Technology -<br>E- mail<br>Windows:<br>Print Screen -<br>Cleaning Up the Disk -<br>Defragmenting the Disk -<br>**Quiz (1, 2, 3, 4, 5) -Windows only** |

| | |
|---|---|
| **Week 7** | Internet, Browsing the Web (Web Browser) , Search the web (search engine) -<br>Security and keeping information safe -<br>-Virus transmission ways to the computer<br>-Protection against viruses<br>-Antivirus, benefits and Types |
| **Week 8** | **Mid Exam** |
| **Week 9** | Microsoft Word<br>- Word Program Interface -<br>-Keyboard Shortcuts in Microsoft Word<br>-The operations on Text<br>File Menu Home Tab & it commands -<br>Insert Tab (Pages & tables Groups) -<br>Table Tools - |
| **Week 10** | Microsoft Word<br>Insert Tab (Illustrations, Header & Footer, Text and Symbols Groups) -<br>Page Layout, References, Review Tabs -<br>**Quiz (Week 8, 9)** |
| **Week 11** | Microsoft PowerPoint<br>PowerPoint program Interface. -<br>File Menu -<br>Home Tab & it commands -<br>Operations on the Slides (duplicate, Delete, and Move) - |
| **Week 12** | Microsoft PowerPoint<br>Insert Tab, Design Tab, Slide Show Tab and their commands -<br>Transitions, and Animations Tabs - |
| **Week 13** | Microsoft Excel<br>- File Menu, Home Tab & it commands |
| **Week 14** | Microsoft Excel<br>Excel Worksheet Basics -<br>Cell format - |
| **Week 15** | **Preparatory Week** |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | **Text** | **Available in the Library?** |
|---|---|---|
| **Required Texts** | 1. M. E. Vermaat and G. B. Shelly, *Discovering Computers Fundamentals: Living in a Digital World,*Shelly Cashman, 2011 Edition.<br>2. J. Lambert, J. Cox , and C. Frye, *Microsoft OfficeProfessional 2010 Step by Step* , 1’st | E-Copy |

| | | |
|---|---|---|
| | Edition, Microsoft Press, 2010, 152P. | |
| **Recommended Texts** | D. Hajek and C. Herrera***, Introduction to Computers 2022 Edition,*** Independently published, May 19, 2022,255P. | NO |
| **Websites** | 1. https://theictbook.com/components-of-the-system-unit-and-their-functions/<br>2. https://www.tutorialspoint.com/computer_fundamentals/index.htm<br>3. https://www.slideshare.net/Jamjolojessa/types-of-application-software?from_action=sav<br>4. https://www.bbc.co.uk/bitesize/guides/zbfny4j/revision/1<br>5. https://generalnote.com/Computer-Fundamental/<br>6. https://edu.gcfglobal.org/en/word2010/#<br>7. https://edu.gcfglobal.org/en/powerpoint2010/#<br>8. https://edu.gcfglobal.org/en/excel2010/#<br>9. https://antivirus.comodo.com/blog/computer-safety/what-is-antivirus<br>10. https://thingscouplesdo.com/what-is-the-antivirus-software-that-is-best-for-a-user | |

## Grading Scheme

مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة

| **Module Information**<br>معلومات المادة الدراسية | | | |
|---|---|---|---|
| **Module Title** | اللغة العربية | **Module Delivery** | |
| **Module Type** | Support | **Theory**<br>**Lecture**<br>Lab<br>Tutorial<br>Practical<br>**Seminar** | |
| **Module Code** | UNI-1212 | | |
| **ECTS Credits** | 2 | | |
| **SWL (hr/sem)** | 50 | | |
| **Module Level** | UG | **Semester of Delivery** | 2 |
| **Administering Department** | | **College** | College of Science |
| **Module Leader** | Othman Khlan Farhan | **e-mail** | othaman@uodiyala.edu.iq |
| **Module Leader's Acad. Title** | Lecturer | **Module Leader's Qualification** | Ph.D. |

| | | | |
|---|---|---|---|
| **Module Tutor** | Name(if available) | **e-mail** | E-mail |
| **Peer Reviewer Name** | Name | **e-mail** | E-mail |
| **Scientific Committee Approval Date** | 01/06/2023 | **Version Number** | 1.0 |

## Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

| | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

| | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | **1- تعريف الطلبة اهم المفاتيح الأساس في التعامل بلغة عربية فصيحة خالية من اي خطأ أو لحنٍ وكيفية التعلم فيما يخص الأدب والنحو والبلاغة والاملاء العربية وكل هذا لغير الاختصاص.**<br>**2- رفع القدرات التعبيرية للطالب، وزيادة ثروتهم اللغوية ، ومساعدتهم على استخدام العبارة المناسبة بشكل دلالي واضح.**<br>**3-تدريب الطلبة على التحدث، والتنظيم المنطقي للأفكار، مع الحرص على التمسك باللغة العربية الفصحى .**<br>**4- رفع الأداء اللغوي العام لدى الطلبة.**<br>**5 - تمكين الطلبة من الكتابة والتعبير والحديث بلغة عربية فصيحة وواضحة.**<br>**6- مساعدة الطلبة في التعبير عن افكارهم من خلال المناقشة والحوار بلغة سهلة وفصيحة .**<br>**7- جعل الطلبة قادرين على اكتساب خزين لغوي من الكلمات واللفاظ والتعابير الفصيحة.**<br>**8- تعلم الطلبة الحفاظ على لغة القرآن التراث العربي الاصيل.** |
| **Module Learning Outcomes** | **الاهداف المعرفية والمهارية:**<br>**1 - يعرف اساليب اللغة العربية.** |

| | |
|---|---|
| مخرجات التعلم للمادة الدراسية | **2- يوظف ادوات الترقيم عند الكتابة .**<br>**3- يتدرب على كيفية تحليل النصوص الادبية .**<br>**4- يعرب بعض الامثلة والتمارين عن الجملة الاسمية والفعلية .**<br>**5-يناقش بعض النصوص القرآنية والادبية .**<br>**6- يبين الفرق بين علامات الاعراب الاصلية والفرعية.**<br>**7- يميز بين الافعال والاسماء في الجمل.**<br>**8– يتدرب على القراءة الواضحة والإلقاء .**<br>**9- يتدرب على الكتابة بخط حسن من خلال التعريف بأنواع الخطوط العربية، وكتابة كل حرف، ثم كتاب الجمل والعبارات بخط الرقعة.**<br>**10- يميز بين حمزة القطع وهمزة الوصل عند الكتابة .**<br>**11- يتعلم اساليب التحدث أمام الآخرين مع استعمال التأشير باليد والعين والجسد بما يتناسب مع الكلام .**<br>**12- يميز بين حرفي الضاد والظاء في الكتابة والنطق.**<br>**13- يميز بين التاء المربوطة والمفتوحة اثناء الكتابة.** |
| **Indicative Contents**<br>المحتويات الإرشادية | توضيح أهمية اللغة العربية وفوائدها بالنسبة للطالب الجامعي (2 ساعة).<br>اللغة، حفظ وتفسير وتحليل أول عشرة آيات من سورة الكهف مع بيان فضل السور ة وسبب تسميتها واهم الاوجه البلاغية والنحوية . (2 ساعة)<br>اللغة، حفظ وتفسير وتحليل ثلاثة آيات من سورة الحجرات مع بيان فضل السور ة وسبب تسميتها واهم الاوجه البلاغية والنحوية. (2 ساعة)<br>الادب، حفظ وتحليل ثلاثة عشر سطراً من قصيدة سفر ايوب في الشعر الحر للشاعر العراقي بدر شاكر السياب مع حياة الشاعر واهم الاوجه البلاغية والنحوية في القصيدة. (2 ساعة)<br>الادب، حفظ وتحليل ثمانية ابيات في الحماس للشاعر ابي الطيب المتنبي مع حياة الشاعر مع اهم الاوجه البلاغية والنحوية في القصيدة. (2 ساعة)<br>قواعد اللغة العربية وأهميتها<br>معرفة اقسام الكلام(الاسم والفعل والحرف)واهم علاماتها.<br>قواعد اللغة العربية :- النكرة والمعرفة، انواع المعارف( العلم ) شرح موضوع (اسم العلم والاسم المركب) مع الأمثلة. (2 ساعة)<br>قواعد اللغة العربية، (الضمائر)شرح موضوع(ضمائر الرفع والنصب والجر) مع الامثلة. (2 ساعة)<br>اللغة، حفظ وتفسير وتحليل سورة الاعلى مع بيان فضل السور ة وسبب تسميتها واهم الاوجه البلاغية والنحوية.<br>الادب، حفظ وتحليل ثمانية ابيات من قصيدة (كن بلسما) للشاعر (ايليا ابي ماضي)مع حياة الشاعر مع اهم الحالات الاعرابية والبلاغية .(2 ساعة) |

| | |
|---|---|
| قواعد اللغة العربية، شرح موضوع (اسماء الاشارة) مع الأمثلة وحالات الاعراب، شرح موضوع (المعرف بالإضافة) مع الأمثلة وحالات الاعراب. (2 ساعة)<br>قواعد اللغة العربية، شرح موضوع (الحال)معرفة الحال وصاحبها وما هي انواع الحال مع الأمثلة وحالات الاعراب. (2 ساعة)<br>الأملاء في اللغة العربية، علامات الترقيم واهميتها في اللغة العربية. (2 ساعة)<br>قواعد اللغة العربية، شرح موضوع (العدد)معرفة تميز العدد وماهي اقسام العدد مع الأمثلة وحالات الاعراب. | |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

| | |
|---|---|
| - **المحاضرة والمشاركة.**<br>- **المناقشة والحوار.**<br>- **العصف الذهني.**<br>- **كتابة التقارير عن الموضوع.**<br>- **السؤال والجواب** . | **Strategies** |

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 2.2 | **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 33 |
| **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 1.13 | **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 17 |
| | | **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 50 |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| Formative assessment | Quizzes | 1 | 10% (10) | 5 | LO #1, #2 and #10, #11 |
| | Assignments | 1 | 10% (10) | 12 | LO #3, #4 and #6, #7 |
| | Projects / Lab. | 1 | 10% (10) | Continuous | All |
| | Report | 1 | 10% (10) | 13 | LO #5, #8 and #10 |
| Summative assessment | Midterm Exam | 2hr | 10% (10) | 7 | LO #1 - #7 |
| | Final Exam | 3hr | 50% (50) | 51 | All |
| Total assessment | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| Week 1 | توضيح أهمية اللغة العربية وفوائدها بالنسبة للطالب الجامعي.<br>اللغة، حفظ وتفسير وتحليل أول عشرة آيات من سورة الكهف مع بيان فضل السور ة وسبب تسميتها واهم الاوجه البلاغية والنحوية |
| Week 2 | اللغة، حفظ وتفسير وتحليل ثلاثة آيات من سورة الحجرات مع بيان فضل السور ة وسبب تسميتها واهم الاوجه البلاغية والنحوية. |
| Week 3 | الادب، حفظ وتحليل ثلاثة عشر سطراً من قصيدة سفر ايوب في الشعر الحر للشاعر العراقي بدر شاكر السياب مع حياة الشاعر واهم الاوجه البلاغية والنحوية في القصيدة. الأدب، حفظ وتحليل ثمانية ابيات من قصيدة (ابى الدهر)للشاعر محمود سامي البارودي. |
| Week 4 | الادب، حفظ وتحليل ثمانية ابيات من قصيدة( الحماسة) للشاعر ابي الطيب المتنبي مع حياة الشاعر مع اهم الاوجه البلاغية والنحوية في القصيدة. |
| Week 5 | قواعد اللغة العربية وأهميتها<br>معرفة اقسام الكلام(الاسم والفعل والحرف)واهم علاماتها. النكرة والمعرفة، انواع المعارف( العلم ) شرح موضوع (اسم العلم والاسم المركب) مع الأمثلة. |
| Week 6 | قواعد اللغة العربية، شرح موضوع(المبتدأ والخبر) تقديم وتأخير المبتدأ والخبر ، وماهي انواع الخبر. |
| Week 7 | قواعد اللغة العربية، (الضمائر)شرح موضوع(ضمائر الرفع والنصب والجر) مع الامثلة. |

| | |
|---|---|
| **Week 8** | **اللغة، حفظ وتفسير وتحليل سورة الاعلى مع بيان فضل السور ة وسبب تسميتها واهم الاوجه البلاغية والنحوية.** |
| **Week 9** | **الادب، حفظ وتحليل ثمانية ابيات من قصيدة (كن بلسما) للشاعر (ايليا ابي ماضي)مع حياة الشاعر مع اهم الحالات الاعرابية والبلاغية. حفظ وتحليل ثمانية ابيات من قصيدة (ارح ركابك)للشاعر محمد مهدي الجواهري.** |
| **Week 10** | **قواعد اللغة العربية، شرح موضوع (اسماء الاشارة) مع الأمثلة وحالات الاعراب، شرح موضوع (المعرف بالإضافة) مع الأمثلة وحالات الاعراب.** |
| **Week 11** | **قواعد اللغة العربية، شرح موضوع (الحال)معرفة الحال وصاحبها وما هي انواع الحال مع الأمثلة وحالات الاعراب.**<br>**الأملاء في اللغة العربية، علامات الترقيم واهميتها في اللغة العربية.** |
| **Week 12** | **قواعد اللغة العربية، شرح موضوع (العدد)معرفة تميز العدد وماهي اقسام العدد مع الأمثلة وحالات الاعراب.** |
| **Week 13** | **الأملاء في اللغة العربية، احكام الهمزة(حمزة الوصل، حمزة القطع، كتابة الهمزة في وسط الكلمة).** |
| **Week 14** | **قواعد اللغة العربية، شرح موضوع (كان واخواتها) مع الامثلة وحالات الإعراب.**<br>**الأملاء في اللغة العربية: احكام كتابة الضاد والظاء** |
| **Week 15** | **قواعد اللغة العربية، شرح موضوع (إن واخواتها) مع الامثلة وحالات الإعراب.**<br>**الأملاء في اللغة العربية: احكام كتابة التاء المربوطة والمفتوحة والالف الممدودة والمقصورة.** |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | 1. القرآن الكريم.<br>2. كتاب البلاغة والتطبيق.<br>3. كتاب الأملاء الواضح .<br>4. منهاج اللغة العربية لغير الاختصاص. | Yes |
| **Recommended Texts** | 1. كتاب شرح ابن عقيل على الفية ابن مالك/ ابن عقيل عبد الله بن عبد الرحمن.<br>2. كتاب الميسر في اللغة العربية لغير الاختصاص/ الدكتور زياد طارق شولي<br>3. كتاب الأملاء الواضح/ للدكتور عباس حسن.<br>4. منهاج اللغة العربية العامة لغير الاختصاص/ عبد القادر حسن امين | Yes |

| | |
|---|---|
| **Websites** | **1- مكتبة المصطفى http://www.al-mostafa.com/index.htm**<br>**2- مكتبة مشكاة الإسلام http://www.almeshkat.net/books/index.php**<br>**3- الجمعية العلمية للغة العربية http://www.imamu.edu.sa/arabiyah**<br>**منتديات الكتب المصورة http://pdfbooks.net/vb/login.php** |

## Grading Scheme

مخطط الدرجات

| Group | Grade | التقدير | Marks % | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

**Second Level**

# Semester THREE

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية للأحياء المجهرية 1

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Microbiology I | | | **Module Delivery** | |
| **Module Type** | Core | | | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar | |
| **Module Code** | BIOT-1311 | | | | |
| **ECTS Credits** | 6 | | | | |
| **SWL (hr/sem)** | 150 | | | | |
| **Module Level** | 2U | | **Semester of Delivery** | 3 | |
| **Administering Department** | Biotechnology | | **College** | College of Science | |
| **Module Leader** | Hiba Hilal | | **e-mail** | Hiba.a@uodiyala.edu.iq | |
| **Module Leader's Acad. Title** | Lecturer | | **Module Leader's Qualification** | **M.Sc.** | |
| **Module Tutor** | Hadeel Areibi | | **e-mail** | Hadeel.a@uodiyala.edu.iq | |
| **Peer Reviewer Name** | | | **e-mail** | | |
| **Scientific Committee Approval Date** | 01/06/2024 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Pathogenic bacteria, mycology, immunology and virology. | **Semester** | |

| | | | |
|---|---|---|---|
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

| | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | **1. Enable students to obtain knowledge and understanding of microbiology.**<br>**2. Providing students with basics and topics related to all branches of microbiology.**<br>**3. This course deals with the basic concept of microbiology.**<br>**4. Improving students' skills in scientific research and providing them with basic skills in conducting scientific research and all applications related to microbiology.**<br>**5. Preparing specialized students familiar with the basics of microbiology, theoretically and practically, who are able to meet the needs of the labor market.**<br>6. **To develop practical microbiological skills principally diagnosis of causative agents of the infections and diseases of humans and Zoology in additions to learning the ways to controlling and overcome the healthy problems.** |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | **1. After taken this course the students can recognize all branches of microbiology and Enhancing their knowledge about them.**<br>**2. List the various terms associated with microbiology.**<br>**3. Summarize what is meant by microorganisms and their relation to our life.**<br>**4. Discuss the most details of microorganisms and their involvement in many other fields such as healthy, ecology, epidemiology, industry and etc.**<br>**5. Be able to describe, recognize and identify the causative structures, shapes and their sizes and arrangement and other details.**<br>**6. Identify the basic requirements and ingredients for each pathogen invaders.**<br>**7. Be familiar with the using of the safe application of some of the basic laboratory equipment that's applying in microbiological studies and researches.**<br>**8. Also be familiar with different strategies for preventing all forms of contamination during the work in the lab. and how can the controlling it.** |
| **Indicative Contents**<br>المحتويات الإرشادية<br>يتضمن الكلمات المفتاحية المهمة للمحاضرات | **Microbes in our Lives:** History of Microbiology, Naming and Classify Microorganism Bacteria, Fungus ,Protozoa ,Algae, Virus<br><br>**Supplies and Growth of microbes:** The Supplies for Growth<br>- Physical elements Chemical and selective ,minimal ,enrich media<br>Types of Chemical principle bonds, PH ,buffer, oxidation |

| | |
|---|---|
| | **Physiology and Metabolism of the bacteria**<br>Microbial metabolism: Is the means by which a microbe obtains the energy and nutrients (e.g. carbon) it needs to live and reproduce<br><br>**Microbial Genetics:** Structure and replication of DNA Genetic Transfer and Recombination Transformation, Conjugation,Transduction<br><br>Principles of Diseases: Pathology, Normal Flora Infection and Disease and Opportunists Hosts, Nosocomial Infections, Transmission, Reservoirs<br><br>**Antimicrobial agents:** Types of antimicrobial agents ,antibiotics ,bacteriocine source of isolates |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.26 |

| | | | |
|---|---|---|---|
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 71 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4.73 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 150 | | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 2, 10 and 11 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4, 6 and 7 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| **Summative assessment** | **Midterm Exam** | 2 hr. | 10% (10) | 7 | LO # 1-7 |
| | **Final Exam** | 2hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | **Material Covered** |
|---|---|
| **Week 1** | **Introduction and history of microbiology** |
| **Week 2** | **Eukaryotes and prokaryotes cells.**<br>**Bacterial cell structure and their function** |
| **Week 3** | **Growth and Nutrition of the bacteria.** |

| | |
|---|---|
| **Week 4** | **Physiology and Metabolism of the bacteria.** |
| **Week 5** | **Bacterial virulence and pathogenesis.** |
| **Week 6** | **Sterilization and disinfection.** |
| **Week 7** | **Mid-term Exam.** |
| **Week 8** | **Antibiotics and chemotherapeutic agents.** |
| **Week 9** | **Bacterial genetics.** |
| **Week 10** | **Mycology / introduction.** |
| **Week 11** | **Fungi Structure, growth, nutrition and reproduction.** |
| **Week 12** | **Classification and pathogenesis.** |
| **Week 13** | **Fungal infection and their causative agents. ( included three lectures).** |
| **Week 14** | **Fungal infection and their causative agents.** |
| **Week 15** | **Fungal infection and their causative agents.** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab 1: **Biosafety procedure, precautions and Microscope.** |
| **Week 2** | Lab 2: **Tools, instruments and equipment.** |
| **Week 3** | Lab 3: **Staining methods of bacteria.** |
| **Week 4** | **Lab 4: Acid fast stains**<br>**( Ziehl – Nielson technique) and special stains.** |
| **Week 5** | Lab 5: **Capsule stain and their types.** |

| | |
|---|---|
| **Week 6** | Lab 6: **Examination.** |
| **Week 7** | Lab 7: **Culture media, preparation and their types.** |
| **Week 8** | **Lab.8: Growing and Cultivation of the bacterial species in the lab.** |
| **Week 9** | **Lab. 9: - Cultivation of the bacteria in the liquid media ( broth) / Motility tests** |
| **Week 10** | **Biochemical test.** |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | **Text** | **Available in the Library?** |
|---|---|---|
| **Required Texts** | 1. Jawetz, Melnick and Adellberg's. (2011). Textbook of Medical Microbiology.26th Edition. | Yes |
| **Recommended Texts** | 2. Connie,R. Mahon; Donald, C. Leham and George Manguselis. (2011): Text book of Diagnostic Microbiology. Fourth edition. | No |
| **Websites** | - https://www.microbiologyresearch.org<br>- https://microbiologysociety.org/why-microbiology-matters/what-is-microbiology.html | |

## Grading Scheme

مخطط الدرجات

| **Group** | **Grade** | التقدير | **Marks (%)** | **Definition** |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |

| | | | | |
|---|---|---|---|---|
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| **(0 – 49)** | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| **Module Information**<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Environmental Microbiology | | | **Module Delivery** | |
| **Module Type** | Core | | | ☒ **Theory**<br>☐**Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar | |
| **Module Code** | BIOT-1312 | | | | |
| **ECTS Credits** | 6 | | | | |
| **SWL (hr/sem)** | 150 | | | | |
| **Module Level** | UC | | **Semester of Delivery** | 3 | |
| **Administering Department** | Biotechnology | | **College** | College of Science | |
| **Module Leader** | Zainaba bed | | **e-mail** | Zainababed@uodiyala.edu.iq | |
| **Module Leader's Acad. Title** | Lecturer | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Mariam Abdeulsalam | | **e-mail** | **Mariamabdul_salam@uodiyala.edu.iq** | |
| **Peer Reviewer Name** | | | **e-mail** | | |

| | | | |
|---|---|---|---|
| **Scientific Committee Approval Date** | 1/06/2024 | **Version Number** | 1.0 |

| **Relation with other Modules**<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Microbiology | **Semester** | 5.26 |
| **Co-requisites module** | Environmental Biotechnology | **Semester** | 4.73 |

| **Module Aims, Learning Outcomes and Indicative Contents**<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | -1 This course deals with the study of microorganisms in different Environments such as soil, water and air.<br>-2 To understand the role of microorganisms in metabolism and recycling of carbon, nitrogen, sulfur and phosphorous compounds.<br>-3 Role of microorganism as pathogen transmission and as microbial indicators for water and food pollution |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | -1 To understand environmental microbiology, Components of Ecosystem (Environment), Some important terms in Environmental Microbiology<br>-2 To know the types of Aquatic microbiology, Importance of aquatic microorganisms and microbial activity in water Column.<br>-3 Understand the Role of Microorganisms in Metabolism of C and N compounds.<br>-4 Understand Role of microorganisms in Phosphorous and Sulfur compounds metabolism.<br>-5 Identifying the types and transmission rout of pathogens in water and waste water, Water borne diseases, Water-washed route, Water-based route, Insect vector route.<br>-6 Understanding the role of microbial Indicators in assessment of water quality.<br>-7 To understand the concept of Soil Microbiology and microbial interaction, major roles and activities of Bacteria in soil.<br>-8 Illustrate the general types and characteristics of Actinomycetes, and study The relation of Actinomycetes to Fungi and bacteria as well clarify Activity |

| | |
|---|---|
| | and function of Actinomycetes in the Soil,<br>9- Identify the major roles of Fungi in soil environment, Roles and activities of Fungi in soil,<br>10- Diagnosis of Pathogens and Parasites in domestic waste water<br>11- Study the concept of Epidemiology and Chain of Infection, transmission of Pathogens and Parasites Found IN Domestic Wastewater.<br>12- Study the relations between microorganisms such as MICROBE–MICROBE INTERACTIONS.<br>13- Illustrate the concept of Symbiosis between Bacteria and Protozoa, Fungus–Bacterium Symbiosis, Prokaryote–Prokaryote Interactions<br>14- Concept of INTERACTIONS BETWEEN MICROORGANISMS AND ANIMALS, Microbe–Animal Interactions: Parasitism, Mutualism, Grazing and Predation by Animals |
| **Indicative Contents**<br>المحتويات الإرشادية<br>يتضمن الكلمات المفتاحية المهمة للمحاضرات | Indicative content includes the following:<br>Definitions of Environmental Microbiology, Components of Ecosystem (Environment).<br>Aquatic microbiology, Importance of aquatic microorganisms, microbial flora and microbial activity in water Column.<br>Role of Microorganisms in biogeochemical cycles (Metabolism of C and N compounds).<br>Role of microorganism's in Phosphorus and Sulfur compounds metabolism.<br>Water and Pathogens, Water borne diseases, classification of Water-associated diseases.<br>Indicators of microbial water quality, Indicator Microorganism, Types of indicators.<br>Soil Microbiology and microbial interaction, Soil Microflora, major roles of Bacteria in soil.<br>Actinomycetes in the soil, Major groups of Actinomycetes, Activity and function of Actinomycetes in the Soil, antibiotics produced by Streptomyces spp.<br>Fungi in soil environment, Common genera of Fungi in soil, Roles and activities of Fungi in soil,<br>Pathogens and Parasites in domestic waste water<br>Elements OF Epidemiology, Pathogens and Parasites Found IN Domestic Wastewater,<br>MICROBE–MICROBE INTERACTIONS, Introduction, Classification of Microbial Interactions, Symbiotic Associations,<br>Symbiosis between Bacteria and Protozoa, Fungus–Bacterium Symbiosis, Prokaryote–Prokaryote Interactions<br>INTERACTIONS BETWEEN MICROORGANISMS AND ANIMALS, Microbe–Animal Interactions. |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the collection of different of water soil and clinical samples. Isolation and primitive identification according to the acquired skills from the theoretical and practical information through lectures and Lab. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا تملئ من قبل المقررية | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.25 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 71 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4.73 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 150 | | |

| Module Evaluation<br>تقييم المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| | | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 3, 5 , 8 and 12 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO # 2, 4, 6 and 9 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 3, 5, 6 and 9 |
| **Summative ن assessment** | **Midterm Exam** | 2 hr. | 10% (10) | 7 | LO # 1-7 |
| | **Final Exam** | 2hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | Definitions of Environmental Microbiology, the need to understand environmental microbiology, Components of Ecosystem (Environment), Some important terms in Environmental Microbiology |
| **Week 2** | Aquatic microbiology, Aquatic microorganisms obtain nutrition in a variety of ways, Importance of aquatic microorganisms, microbial flora and microbial activity in water Column, Metabolic Rate and Temperature, Factor affects the microbes in water such as temperature, gases, salinity |
| **Week 3** | Role of Microorganisms in biogeochemical cycles (Metabolism of C and N compounds), The Carbon Cycle, Biodegradation, Nitrogen Cycle, Nitrogen fixation, Ammonificant of N compounds, nitrification, denitrification |
| **Week 4** | Role of microorganisms P and S metabolism, Microorganisms in Phosphorus cycle, Microorganisms in Sulfur Cycle and Metabolism, Sulfur oxidizing and sulfur reducing bacteria, Characteristics of Sulfur-oxidizing and reducing prokaryotes are, Sulfate assimilation. |
| **Week 5** | Water and Pathogens, Water borne diseases, Main Sources of Water Microbial Pollution, Water- Examples of waterborne diseases, classification of Water-associated diseases, A. Water- ), C.قلة او ندرة استخدام المياهborne route, B. Water-washed route (Water shortage ( ) طرق انتقال الامراض بالاعتماد على المياه)based route طرق الانتقال عن طريق, D. Insect vector route الحشرات |
| **Week 6** | Indicators of microbial water quality, Indicator Microorganism, Types of indicators, fecal coliform and total coliform, Fecal Streptococci, Current methods of detection Microbial indicators |
| **Week 7** | Mid-term Exam. |
| **Week 8** | Soil Microbiology and microbial interaction, Definition of soil environment, Soil Particles size and layers, Soil Living organic matter (Soil Biota or organisms), Soil Microflora, major roles of Bacteria in soil, Rhizosphere zone in soli, Microbial activity in rhizosphere zone. |
| **Week 9** | Actinomycetes in the soil, the general characteristics of Actinomycetes, the relation of Actinomycetes to Fungi, Distribution and abundance of Actinomycetes, comparison of Actinomycetes with the true bacteria, Environmental Influences on Actinomycetes in soil, Major groups of Actinomycetes, Activity and function of Actinomycetes in the Soil, Significance of Actinomycetes, Actinomycetes Antibiotics, antibiotics produced by Streptomyces spp. |
| **Week 10** | Fungi in soil environment, Environmental influences on the fungus in soil, Common genera of Fungi in soil, Yeast in soil, Roles and activities of Fungi in soil, |
| **Week 11** | Pathogens and Parasites in domestic waste water |

| | |
|---|---|
| | Elements OF Epidemiology, Some Definitions, Chain of Infection, Pathogens and Parasites Found IN Domestic Wastewater, Bacterial Pathogens, Viral Pathogens, Protozoan Parasites, Helminth Parasites |
| **Week 12** | MICROBE–MICROBE INTERACTIONS, Introduction, Classification of Microbial Interactions, Symbiotic Associations, |
| **Week 13** | Symbiosis between Bacteria and Protozoa, Fungus–Bacterium Symbiosis, Prokaryote–Prokaryote Interactions |
| **Week 15** | INTERACTIONS BETWEEN MICROORGANISMS AND ANIMALS, Introduction, Primary and Secondary Symbionts, Microbe–Animal Interactions: Parasitism, Microbe–Animal Interactions: Mutualism, Microbial–Vertebrate Interactions, Grazing and Predation by Animals |
| **Week 16** | **Preparatory week before the final Exam** |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

| | **Material Covered** |
|---|---|
| **Week 1** | Introduction to microbiology |
| **Week 2** | Dilution and plating of bacteria and growth curve |
| **Week 3** | Preparation of microbiolovical culture media |
| **Week 4** | Isolation of fungi and Actinomycetes from soil |
| **Week 5** | Bacteriological test of water: the coliform MPN test |
| **Week 6** | Water quality standarda and Isolation of Some Water borne Pathogens |
| **Week 7** | Effect of environmental factors on microbial growth |
| **Week 8** | Biological Oxygen demand (BOD) |
| **Week 9** | Antibacterial activity of bioactive compounds produced by Streptomyces spp. Isolated from agricultural soil |
| **Week 10** | |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | **Text** | **Available in the Library?** |
|---|---|---|
| **Required Texts** | Environmental Microbiology, second edition<br>Waste water microbiology third edition | Yes |

| | | |
|---|---|---|
| | Environmental biotechnology, second edition | |
| **Recommended Texts** | Waste water microbiology third edition<br>Environmental biotechnology, second edition | Yes |
| **Websites** | | |

| **Grading Scheme**<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **Group** | **Grade** | التقدير | **Marks (%)** | **Definition** |
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** – Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Nanobiotechnology | | | **Module Delivery** | |
| **Module Type** | CORE | | | ☐ **Theory**<br>☐ **Lecture**<br>☐ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☐ Semina**r** | |
| **Module Code** | BIOT-1313 | | | | |
| **ECTS Credits** | 6 | | | | |
| **SWL (hr/sem)** | 150 | | | | |
| **Module Level** | 2 | | **Semester of Delivery** | 3 | |
| **Administering Department** | Biotechnology | | **College** | College of Science | |
| **Module Leader** | Marwa Rashid | | **e-mail** | phdjwameer@gmail.com | |
| **Module Leader's Acad. Title** | Lecturer | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | | | **e-mail** | | |
| **Scientific Committee Approval Date** | | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Biotechnology | **Semester** | |
| **Co-requisites module** | Principle of biotechnology | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | 1. This course deals with the basic concept of nanotechnology<br>2. To understand the important of nanotechnology and its applications in biotechnology. |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | 1. To know the definition and history of nanotechnology<br>2. To know the new properties of nanomaterilas<br>3. To Describe the different methods of synthesis nanomaterials<br>4. To know the types of nanomaterials<br>5. Explain the characterization of nanomaterial by using different techniques<br>6. Explain Direct methods of characterization<br>7. Explain indirect methods of characterization<br>8. Determine the applications of nanotechnology in different aspects<br>9. Applications of nanotechnology in biomedical field<br>10. Learning about the toxicity and how can be reduced it |
| **Indicative Contents**<br>المحتويات الإرشادية<br>يتضمن الكلمات المفتاحية<br>المهمة للمحاضرات | Indicative content includes the following:-<br>-Introduction, history different between micro and nan scale<br>- Understand various chemical and physical methods for the synthesis of nanomaterials<br>-information on the specific details of both bottom up and top-down synthesis<br>- Understand various biological methods for the synthesis of nanomaterials<br>-Classification of nanomaterials ,metal and organic nanomaterials<br>- Understand phase rule/phase diagrams<br>-Coating thin-film metals and semiconductors using different methods<br>-The principle and working of UV -Vis absorption spectroscopy relation of absorption peak of metal nanoparticles with size and shape changes and SEM ,TEM and AFM techniques. |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | .Visualization, Teamwork Cooperative Learning, Differentiated Instruction Using new Technology, Student-led Classroom: ,Student Centred Inquiry and Professional Development |

| | |
|---|---|

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.26 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 71 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4.73 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 150 | | |

| Module Evaluation<br>تقييم المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| | | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 2, 10 and 11 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4, 6 and 7 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| **Summative assessment** | **Midterm Exam** | 2 hr | 10% (10) | 7 | LO # 1-7 |
| | **Final Exam** | 2hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | Introduction to the course |
| **Week 2** | Historical perspective of micro and nano scale |
| **Week 3** | Nano manufacturing technology, Advantages and applications of nanotechnology |
| **Week 4** | Nano manufacturing technology, Advantages and disadvantages |

| | |
|---|---|
| **Week 5** | Overview of Nano Fabrication Methods: Top-down and bottom-up approaches |
| **Week 6** | Types of nanomaterials organic and inorganic nanomaterials |
| **Week 7** | MID TERM EXAM |
| **Week 8** | Quantum dots, etc., Organic compounds and bio-applications of nano materials |
| **Week 9** | Characterization Tools, Optical microscopy and Spectrophotometer, Scanning Electron Microscope, AFM |
| **Week 10** | Application of nano materials, Carbon Nano Tubes |
| **Week 11** | Nanopharmaceuticals and Nanomedical Device |
| **Week 12** | Bioengineered Nanomaterials |
| **Week 13** | Nanosensors |
| **Week 14** | Nanotoxicology |
| **Week 15** | Nanobiotechnology and Tissue Engineering |
| **Week 16** | **Preparatory week before the final Exam** |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

| | **Material Covered** |
|---|---|
| **Week 1** | Lab 1: Introduction |
| **Week 2** | Lab 2: Synthesis Metal Nanoparticles |
| **Week 3** | Lab 3: Synthesis of nanomaterials by chemical method |
| **Week 4** | Lab 4: Synthesis of nanomaterials by physical method |
| **Week 5** | Lab 5: Synthesis of nanomaterials by biological method |
| **Week 6** | Lab 6: Nanomaterial characterization techniques |
| **Week 7** | Lab 7: Biological bio-medical applications: Antibacterial activity test |
| **Week 8** | Lab 8: Antifungal activity test |
| **Week 9** | Lab 9: Nanosensers |
| **Week 10** | Lab 10: nanocomposites |

## Learning and Teaching Resources

| مصادر التعلم والتدريس | | |
|---|---|---|
| | | **Available in the Library?** |
| **Required Texts** | Textbook of Nanoscience Nanotechnology B S Murty, P Shankar, Baldev Raj, B B Rath and James Murday.2013 | |
| **Recommended Texts** | Nanomaterials in Bionanotechnology: Fundamentals and Applications. Singh and Kshitij RB Singh.ISBN: 9780367689445.2021 | |
| **Websites** | file:///C:/Users/Toshiba/Downloads/TextbookofNanoscienceandNanotechnology.pdf<br>https://web.pdx.edu/~pmoeck/phy381/intro-nanotech.pdf | |

| **Grading Scheme**<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **Group** | **Grade** | التقدير | **Marks (%)** | **Definition** |
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** – Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| **Module Information**<br>معلومات المادة الدراسية | | |
|---|---|---|
| **Module Title** | Biochemistry1 | **Module Delivery** |

| | | | | |
|---|---|---|---|---|
| **Module Type** | Core | | | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar |
| **Module Code** | BIOT-1314 | | | |
| **ECTS Credits** | 5 | | | |
| **SWL (hr/sem)** | 125 | | | |
| **Module Level** | UG | **Semester of Delivery** | 3 | |
| **Administering Department** | Biotechnology | **College** | College of Science | |
| **Module Leader** | Ibtihal Sabri | **e-mail** | dr.ebtehal@uodiyala.edu.iq | |
| **Module Leader's Acad. Title** | Lecturer | **Module Leader's Qualification** | Ph.D | |
| **Module Tutor** | Assel Faiq | **e-mail** | aseelaa084@gmail.com | |
| **Peer Reviewer Name** | | **e-mail** | | |
| **Scientific Committee Approval Date** | 01/06/2024 | **Version Number** | 1.0 | |

## Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

| | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

| | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | -1 Aims of biochemistry to study biomolecules and their components such as enzymes, proteins, hormones, antibiotics, and organic acids, and to identify their importance and role in the bodies of living organisms and to exploit them in diagnosing and treating diseases and abnormalities that afflict livingthings<br>-2 Acquisition of practical, scientific, and laboratory information about the basics of biochemistry, which plays a very large role in the medical and pharmaceutical sectors and in many very important jobs. These fields or specializations include the industrial, health, academic, and many other fields. |

| | |
|---|---|
| | Identify chemical compounds and understand the biochemical reactions that take place in the human body. -3<br>Understanding of the chemical properties of biomolecules and the ability to use and combine biochemical techniques with genetics and physical biology techniques as well as molecular biology. -4<br>The ability to diagnosis of diseases through blood indicators and give the ability to understand normal and pathological phenomena in the human body through theoretical and practical lessons. -5<br>Conducting advanced research in the fields of basic and clinical biochemistry that Serve the community. -6 |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Learn what is carbohydrate and its importance, Carbohydrate is the nutritional component that gives energy. -1<br>Classification of carbohydrates, Hemiacetal formation of monosaccharide structure -2<br>Draw Haworth and Chair projection for Glucose and Fructose from Fischer projection, Formation of alpha and beta glycosidic linkages in disaccharides and polysaccharides. -3<br>General idea about lipid structure and properties. Classify lipids, Understanding the major physiological functions of fatty acids. -4<br>Understanding the structure of saturated or unsaturated fatty acids and study the relation between the structure and function of fatty acids. -5<br>Learning about amino acids, their structure, and types. -6<br>Identify how amino acids form proteins and Define essential and nonessential amino acids. -7<br>Distinguish between different types of amino acids and Detection of functional groups in amino acids. -8<br>Understanding the Solubility of amino acids and proteins and solubility as a function of solution PH. -9<br>Understanding the denaturation and Adaptation denaturation of Protein Altering protein's 3 dimensional structure. -10 |
| **Indicative Contents**<br>المحتويات الإرشادية<br>يتضمن الكلمات المفتاحية المهمة للمحاضرات | Indicative content includes the following.<br><br>Carbohydrate: properties of Carbohydrate. Classification of Carbohydrate (Monosaccharide's - Disaccharides, Polysaccharides), derivatives of monosaccharide's. Lipids : - Classification of lipid , saturated and unsaturated fatty acids , Essential fatty , Cholesterol. Amino acids : Classification of Amino Acids , acids , Phospholipids Properties of Amino Acids , Glutathione. Proteins : classification Based on Functions , Physical and chemical properties. Structure of Proteins , Denaturation of Proteins. |

## Learning and Teaching Strategies

| استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Biochemistry teaching strategy for biotechnology specialty students, conducted through an improved lecture format with a brief content and multimedia courseware. This is done By using the brainstorming method, , and using the discussion method to stimulate thinking and participation of students and to provide an opportunity for questions and discussion, while respecting their opinions and suggestions, and this method helps in developing the student's personality cognitively, emotionally and skillfully. Also using the methods of thinking maps, it is an effective teaching strategy in representing knowledge through schematic forms that link concepts to each other. Concept maps are used to present new information, discover relationships between concepts, deepen understanding, summarize information, and evaluate the lesson. Encouraging students to prepare reports and present seminars with conducting tests to assess students' understanding and levels. |

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)** الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا | 5.26 |
| **Unstructured SWL (h/sem)** الحمل الدراسي غير المنتظم للطالب خلال الفصل | 46 | **Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3.06 |
| **Total SWL (h/sem)** الحمل الدراسي الكلي للطالب خلال الفصل | 125 | | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 2, 8 and 11 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4, 6 and 5 |

| | | | | | |
|---|---|---|---|---|---|
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 9 and 10 |
| **Summative assessment** | **Midterm Exam** | 2hr | 10% (10) | 7 | LO # 1-7 |
| | **Final Exam** | 2hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | **Material Covered** |
|---|---|
| **Week 1** | Carbohydrate- difination and classification |
| **Week 2** | Physical and chemical properties of Charbohydrate |
| **Week 3** | Monosaccharide's , isomerism , derivatives of monosaccharides |
| **Week 4** | Disaccharides , classification of disaccharides |
| **Week 5** | Polysaccharides , , classification of polysaccharides |
| **Week 6** | Lipids – Definition - Properties – Classification |
| **Week 7** | Midterm Exam |
| **Week 8** | Simple Lipids , Essential fatty acids , saturated and unsaturated fatty acids |
| **Week 9** | , sphingolipids, Cholesterol Compound Lipids - Phospholipids |
| **Week 10** | Amino acids - Classification of Amino Acids |
| **Week 11** | Properties of Amino Acids , Biologically Important Peptides , Glutathione |
| **Week 12** | Proteins - difination and classification Based on Functions |
| **Week 13** | classification Based on Physical and chemical properties (Simple proteins - Conjugated proteins and Derived proteins |
| **Week 14** | Structure of Proteins , Denaturation of Proteins |

| | |
|---|---|
| **Week 15** | **Preparatory week** |
| **Week 16** | **final Exam** |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

| | **Material Covered** |
|---|---|
| **Week 1** | Lab 1: Chemical laboratory safety. |
| **Week 2** | Lab 2: Methods expressing concentration. |
| **Week 3** | Lab 3: General test for carbohydrates, reducing tests, pentose's test and ketoses test of sugars. |
| **Week 4** | Lab 4: Osazones test, sucrose test, polysaccharides test and hydrolysis of starch. |
| **Week 5** | Lab 5: Qualitative tests of lipids. |
| **Week 6** | Lab 6: Quantitative tests of lipids. |
| **Week 7** | Lab 7: Ninhydrin test, xanthoprotic test, Millon test, glyoxylic test. |
| **Week 8** | Lab Lead sulphide test, Nitroprusside test, sakaguchi test. |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | **Text** | **Available in the Library?** |
|---|---|---|
| **Required Texts** | Introduction to general organic and biochemistry<br>University of Illinois, Urbana-Champaign | Yes |

| | | |
|---|---|---|
| **Recommended Texts** | Lippincott's<br>Illustrated Reviews: Biochemistry<br>ESSENTIALS OF BIOCHEMISTRY<br>Pankaja Naik PhD ,Professor and Head<br>Department of Biochemistry, MVPS Dr Vasantrao Pawar Medical College Nashik, Maharashtra , India | No |
| **Websites** | http://www.schoolarabia.net/kemya/kymia_hyatia/main.htm | |

## Grading Scheme

مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Animal physiology | | | **Module Delivery** | |
| **Module Type** | Core | | | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar | |
| **Module Code** | BIOT-1315 | | | | |
| **ECTS Credits** | 5 | | | | |
| **SWL (hr/sem)** | 125 | | | | |
| **Module Level** | UG | | **Semester of Delivery** | 3 | |
| **Administering Department** | Biotechnology | | **College** | College of Science | |
| **Module Leader** | Massar Hadi | | **e-mail** | Masarhadi@uodiyala.edu.iq | |
| **Module Leader's Acad. Title** | Lecturer | | **Module Leader's Qualification** | | |
| **Module Tutor** | **Vean Ahsan** | | **e-mail** | veanahsan44@gmail.com | |
| **Peer Reviewer Name** | | | **e-mail** | | |
| **Scientific Committee Approval Date** | 01/06/2024 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Histology, Microtechnique , cytology | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | 1. To provide a course of study in mammalian, principally human, systems physiology, introducing students to the principles of normal biological function in the Human body<br>2. To explore the fundamental concepts of human physiology from cellular functions through to systems that are responsible for homeostasis.<br>3. To prepare students for subsequent biological courses that require an understanding of the physiology of the Human body<br>4. To understand how human maintains an internal steady state, how they acquire nutrients, and how they detect and respond to changes in their environments<br>5. To develop practical biological skills principally Physiology, Development & Neuroscience, but also Pharmacology, Pathology, and Zoology, among others. |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | At the end of the course, students should:<br>1. Have an enhanced knowledge and appreciation of mammalian physiology<br>2. Understand the functions of important physiological systems including the cardio-respiratory, renal, reproductive, and metabolic systems<br>3. Understand how these separate systems interact to yield integrated physiological responses to challenges such as exercise, fasting, and ascent to high altitude, and how they can sometimes fail<br>4. be able to perform, analyses, and report on experiments and observations in physiology<br>5. be able to recognize and identify principal tissue structures<br>6. Be familiar with the safe use and application of some of the basic laboratory equipment used in physiological studies of animals |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following.<br>• Physiology: Definitions, Methods of Physiology<br>• Homeostasis, mechanisms, examples |

| | |
|---|---|
| يتضمن الكلمات المفتاحية المهمة للمحاضرات | • Nervous systems, neuron types, myelin<br>• Impulse formation, synapses<br>• Muscular system, types, sarcomere, contractile filaments<br>• Sliding theory, neuromuscular junction, muscle twitch<br>• Circulatory system, heart, vessels, valves, heart sounds<br>• Heart circuits, heart rate, conduction system<br>• Respiratory system, lung, alveoli, respiratory volumes<br>• Urinary system, kidney, nephrons, urine formation<br>• Filtration, Reabsorption, secretion<br>• Digestive system, stomach, mechanical, chemical digestion,<br>• Digestive enzymes, liver, pancreas<br>• Endocrine system, hormones, pheromones |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

| | |
|---|---|
| **Strategies** | 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 the following:<br>- Providing students with the basics and additional topics related to the pre-skills education outcomes to solve scientific problems<br>-Solve a set of practical examples by the academic staff<br>-Students' participation during the lecture to solve some scientific issues<br>- Summer training |

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.26 |

| | | | |
|---|---|---|---|
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 46 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3.06 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 125 | | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 2, 10 and 11 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4, 6 and 7 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| **Summative assessment** | **Midterm Exam** | 2 hr | 10% (10) | 7 | LO # 1-7 |
| | **Final Exam** | 2hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | **Material Covered** |
|---|---|
| **Week 1** | Introduction to physiology, scientific method, measurements, history of physiology, homeostasis, Homeostatic mechanisms |
| **Week 2** | Nervous system , the function of NS, Division of NS, Neuron (structure and types) , supporting cells (types and function) , myelin |

| | |
|---|---|
| **Week 3** | Electrical activity of nerves, impulse formation, active potential, resting potential ,refractory period , synapses electrical – gap junction- , chemical synapses, neurotransmitters (types , functions) |
| **Week 4** | Muscular system, types of muscles (skeletal , cardiac,smooth0 (structure and function) , sarcomere (structure and function) , |
| **Week 5** | muscle contraction mechanism, Motor unit isometric and isotonic contractions, muscle fatigue muscle fuels |
| **Week 6** | Circulatory system, (cardiovascular system and lymphatic system), Arteries, and veins, (pulmonary circuit and systemic circuit) function of circulatory system , role of capillaries , blood flow. |
| **Week 7** | **MID TERM EXAM** |
| **Week 8** | Heart (structure and function ) , Heart chambers and valves , cardiac cycle , heart sounds , heart murmers , electrical activity of heart , conduction system , pulse , blood pressure , cardiac output , eart rate.8control of h |
| **Week 9** | Respiratory system , component of RS , lung , function of RS, Respiration , Cellular respiration , breathing (external and internal respiration) , factors of normal respiration , breathing cycle , inspiration and expiration mechanism , respiratory values , |
| **Week 10** | Gas exchange between alveoli and blood and between blood and tissue , respiratory quotient , gas transport , respiratory pigments, Alveolar ventilation ,exchange of gases, composition of air and partial pressure of gases ,transport of gases in the blood stream (O2,CO2) |
| **Week 11** | Urinary system, (structure and function), kidney (structure and function), nephron, glomerular filtration, rate of glomerular filtration, measurements using inulin, absorption of material in each part of the nephron, tubular secretion, nervous and hormonal regulation of kidney function, calcium balance, pH balance, sodium and potassium balance, water balance, the composition of urine,anti-diuretic hormone. |
| **Week 12** | Digestive system, structure and function of DS, phases of digestion, Stomach, HCl formation, Small intestine, villi, large intestine, |
| **Week 13** | auxiliary glands, gall bladder, bile acids, bile pigments, bilirubin, biliverdin, liver |
| **Week 14** | Endocrine glands: pituitary, thyroid, adrenal, pancreas, |
| **Week 15** | The preparatory week before the Final Exam |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

| Week | Material Covered |
|---|---|
| **Week 1** | Lab 1: Hematology. Blood collection & |
| **Week 2** | Lab 1:Anticoagulants |
| **Week 3** | Determination of Hb, |
| **Week 4** | Lab 1:Determination of ESR |
| **Week 5** | Lab 1:Determination of bleeding time & clotting time |
| **Week 6** | Lab 1:RBC count, |
| **Week 7** | Lab 1:WBC count |
| **Week 8** | Exam |
| **Week 9** | Lab 1:Differential count of WBC |
| **Week 10** | Lab 1:Blood group & Rh typing |
| **Week 11** | Determination of Blood pressure |
| **Week 12** | Lab 1:Blood disease |
| **Week 13** | Lab 1:Fragility test |
| **Week 14** | Lab 1:Liver function tests |
| **Week 15** | Exam |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Human Physiology/ Stuart Iron Fox/2004<br>أساسيات علم الفسلجة / عبد الرحيم عشير وصباح ناصر العلوجي | Yes |
| **Recommended Texts** | A textbook of practical physiology, 2013 (8th edition) | No |

| | | |
|---|---|---|
| | ENDOCRINE SECRETS, 6th ed., Michael T. McDermott,2013 | |
| **Websites** | https://en.wikipedia.org/wiki/Physiology<br><br>https://www.medicalnewstoday.com/articles/248791 | |

## Grading Scheme

مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# Semester FOUR

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Microbiology 2 | | | **Module Delivery** | |
| **Module Type** | Core | | | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar | |
| **Module Code** | BIOT-1416 | | | | |
| **ECTS Credits** | 6 | | | | |
| **SWL (hr/sem)** | 150 | | | | |
| **Module Level** | UG | | **Semester of Delivery** | 4 | |
| **Administering Department** | Biotechnology | | **College** | College of Science | |
| **Module Leader** | Hiba Ali | | **e-mail** | Hiba.a@uodiyala.edu.iq | |
| **Module Leader's Acad. Title** | Lecturer | | **Module Leader's Qualification** | M.Sc. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2024 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Pathogenic bacteria, mycology, immunology and virology. | **Semester** | 3 |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | **.1 Enable students to obtain knowledge and understanding of microbiology.**<br>**.2 Providing students with basics and topics related to all branches of microbiology.**<br>**.3 This course deals with the basic concept of microbiology.**<br>**.4 Improving students' skills in scientific research and providing them with basic skills in conducting scientific research and all applications related to microbiology.**<br>**.5 Preparing specialized students familiar with the basics of microbiology, theoretically and practically, who are able to meet the needs of the labor market.**<br>**.6 To develop practical microbiological skills principally diagnosis of causative agents of the infections and diseases of humans and Zoology in additions to learning the ways to controlling and overcome the healthy problems.** |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | **.1 After taken this course the students can recognize all branches of microbiology and Enhancing their knowledge about them.**<br>**.2 List the various terms associated with microbiology.**<br>**.3 Summarize what is meant by microorganisms and their relation to our life.**<br>**.4 Discuss the most details of microorganisms and their involvement in many other fields such as healthy, ecology, epidemiology, industry and etc.**<br>**.5 Be able to describe, recognize and identify the causative structures, shapes and their sizes and arrangement and other details.**<br>**.6 Identify the basic requirements and ingredients for each pathogen invaders.**<br>**.7 Be familiar with the using of the safe application of some of the basic laboratory equipment that's applying in microbiological studies and** |

| | |
|---|---|
| | researches.<br>**Also be familiar with different strategies for preventing all forms of contamination during the work in the lab. and how can the controlling it.** .8 |
| **Indicative Contents**<br>المحتويات الإرشادية<br>يتضمن الكلمات المفتاحية المهمة للمحاضرات | **Microbes in our Lives:** History of Microbiology, Naming and Classify Microorganism Bacteria, Fungus ,Protozoa ,Algae, Virus<br><br>**Supplies and Growth of microbes:** The Supplies for Growth<br>- Physical elements Chemical and selective ,minimal ,enrich media<br>Types of Chemical principle bonds, PH ,buffer, oxidation<br><br>**Physiology and Metabolism of the bacteria**<br>Microbial metabolism: Is the means by which a microbe obtains the energy and nutrients (e.g. carbon) it needs to live and reproduce<br><br>**Microbial Genetics:** Structure and replication of DNA Genetic Transfer and Recombination Transformation, Conjugation,Transduction<br><br>Principles of Diseases: Pathology, Normal Flora Infection and Disease and Opportunists Hosts, Nosocomial Infections, Transmission, Reservoirs<br><br>**Antimicrobial agents:** Types of antimicrobial agents ,antibiotics ,bacteriocine source of isolates |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, |

| | |
|---|---|
| | interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. |

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)** الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا | 5.26 |
| **Unstructured SWL (h/sem)** الحمل الدراسي غير المنتظم للطالب خلال الفصل | 71 | **Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4.73 |
| **Total SWL (h/sem)** الحمل الدراسي الكلي للطالب خلال الفصل | 501 | | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 2, 10 and 11 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4, 6 and 7 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| **Summative assessment** | **Midterm Exam** | 2 hr. | 10% (10) | 7 | LO # 1-7 |
| | **Final Exam** | 2hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| **Week 1** | **Introduction and history of microbiology** |
| **Week 2** | **Eukaryotes and prokaryotes cells. -**<br>**Bacterial cell structure and their function -** |
| **Week 3** | **Growth and Nutrition of the bacteria.** |
| **Week 4** | **Physiology and Metabolism of the bacteria.** |
| **Week 5** | **Bacterial virulence and pathogenesis.** |
| **Week 6** | **Sterilization and disinfection.** |
| **Week 7** | **Mid-term Exam.** |
| **Week 8** | **Antibiotics and chemotherapeutic agents.** |
| **Week 9** | **Bacterial genetics.** |
| **Week 10** | **Mycology / introduction.** |
| **Week 11** | **Fungi Structure, growth, nutrition and reproduction.** |
| **Week 12** | **Classification and pathogenesis.** |
| **Week 13** | **Fungal infection and their causative agents. ( included three lectures).** |
| **Week 14** | **Fungal infection and their causative agents.** |
| **Week 15** | **Fungal infection and their causative agents.** |
| **Week 16** | **Preparatory week before the final Exam** |

## Delivery Plan (Weekly Lab. Syllabus)

| المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab 1: **Biosafety procedure, precautions and Microscope.** |
| **Week 2** | Lab 2: **Tools, instruments and equipment.** |
| **Week 3** | Lab 3: **Staining methods of bacteria.** |
| **Week 4** | **Lab 4: Acid fast stains ( Ziehl – Nielson technique) and special stains.** |
| **Week 5** | Lab 5: **Capsule stain and their types.** |
| **Week 6** | Lab 6: **Examination.** |
| **Week 7** | Lab 7: **Culture media, preparation and their types.** |
| **Week 8** | **Lab.8: Growing and Cultivation of the bacterial species in the lab.** |
| **Week 9** | **Lab. 9: - Cultivation of the bacteria in the liquid media ( broth) / Motility tests** |
| **Week 10** | **Biochemical test.** |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | **Text** | **Available in the Library?** |
|---|---|---|
| **Required Texts** | .2 Jawetz, Melnick and Adellberg's. (2011). Textbook of Medical Microbiology.26th Edition. | Yes |
| **Recommended Texts** | 2. Connie,R. Mahon; Donald, C. Leham and George Manguselis. (2011): Text book of Diagnostic Microbiology. Fourth edition. | No |

| | |
|---|---|
| **Websites** | - https://www.microbiologyresearch.org<br>- https://microbiologysociety.org/why-microbiology-matters/what-is-microbiology.html |

| Grading Scheme<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **Group** | **Grade** | التقدير | **Marks (%)** | **Definition** |
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | |
|---|---|---|
| **Module Title** | Biological Control | **Module Delivery** |

| | | | |
|---|---|---|---|
| **Module Type** | Core | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar | |
| **Module Code** | BIOT-1417 | | |
| **ECTS Credits** | 5 | | |
| **SWL (hr/sem)** | 125 | | |

| | | | |
|---|---|---|---|
| **Module Level** | UG | **Semester of Delivery** | 4 |
| **Administering Department** | Biotechnology | **College** | College of Science |
| **Module Leader** | Maryam Abdulsalam | **e-mail** | Mariamabdul_salam@uodiyala.edu.iq |
| **Module Leader's Acad. Title** | Lecturer | **Module Leader's Qualification** | M.Sc. |
| **Module Tutor** | Name (if available) | **e-mail** | E-mail |
| **Peer Reviewer Name** | Name | **e-mail** | E-mail |
| **Scientific Committee Approval Date** | 01/06/2024 | **Version Number** | 1.0 |

## Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

| | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

| | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | -1 To learn the general concepts of biological control and the important organisms involved in it.<br>-2 This course deals with the basic concepts of natural control, pests, natural enemies (biological control agents).<br>-3 To identify the strategies of biological control.<br>-4 Understand the general methods of pest control.<br>-5 To identify the Interactions between plants and beneficial microbes.<br>-6 To understand the microbial insecticides |

| | |
|---|---|
| | This course deals with the biological control of different plant pathogens (Bacteria, Fungi, Nematodes, filamentous Algae, and weeds). -7<br>To develop skills for detecting microorganisms that cause plant diseases. -8 |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Enable students to obtain knowledge and understanding of biological control. -1<br>List the various terms associated with biological control. -2<br>Learn about traditional control methods and modern methods of pest control. -3<br>Discuss the general advantages and limitations of biological control. -4<br>Summarize the biological control strategies. -5<br>Describe the most important organisms used in the control of insects, nematodes, algae, weeds, and fungi and their mechanisms of action. -6<br>Discuss the use of bacteria, their metabolic products, or their spores, to control other organisms that cause economic damage. -7<br>Explain the use of fungi, their products to control other organisms that cause economic damage. -8<br>Discuss the use of insects to control other organisms that cause economic damage. -9<br>Explain the use of nematodes to control other organisms that cause economic damage. -10 |
| **Indicative Contents**<br><br>المحتويات الإرشادية<br><br>يتضمن الكلمات المفتاحية المهمة للمحاضرات | Indicative content includes the following.<br><br><u>Part A – General concepts</u><br><br>Introduction to Biological Control – Important Terms, What is biological pest control?, General Advantages and Limitations of Biological Control, Natural Control, Pests, Natural enemies(Biological Control Agents), Strategies of Biological Control, Properties of Classical Biological Control, The general methods of pest control, Interactions between Plants and Beneficial Microbes. [20 hrs]<br><br><u>Part B -The Insecticides</u><br><br>Microbial Insecticides- Microbial Insecticides (Advantages and Disadvantages), Bacterial insecticide, Fungi as Agents of Biocontrol. [18 hrs]<br><br><u>Part C - Biological Control of Pathogens</u><br><br>Biological Control of Plant Pathogens- Biological control of Nematodes, Biological control of filamentous Algae, Biological control of weeds. [22 hrs] |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.26 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 46 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3.06 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 125 | | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 2, 10 and 11 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4, 6 and 7 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |

| | | | | | |
|---|---|---|---|---|---|
| **Summative assessment** | **Midterm Exam** | 2 hr | 10% (10) | 7 | LO # 1-7 |
| | **Final Exam** | 2hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | **Material Covered** |
|---|---|
| **Week 1** | Important Terms in Biological control |
| **Week 2** | Introduction, What is biological pest control?, General Advantages and Limitations of Biological Control, Natural Control, Pests, Natural enemies |
| **Week 3** | Strategies of Biological Control, Properties of Classical Biological Control |
| **Week 4** | The general methods of pest control |
| **Week 5** | Interactions between Plants and Beneficial Microbes |
| **Week 6** | Microbial Insecticides (Advantages and Disadvantages), Bacterial insecticide(P1) |
| **Week 7** | MID TERM EXAM |
| **Week 8** | Microbial Insecticides (Advantages and Disadvantages), Bacterial insecticide(P2) |
| **Week 9** | Fungi as Agents of Biocontrol |
| **Week 10** | Biological Control of Plant Pathogens |
| **Week 11** | Biological control of Nematodes(P1) |
| **Week 12** | Biological control of Nematodes(P2) |
| **Week 13** | Biological control of filamentous Algae |
| **Week 14** | Biological control of weeds |
| **Week 15** | **Preparatory week before the final Exam** |

| | |
|---|---|
| **Week 16** | |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

| | **Material Covered** |
|---|---|
| **Week 1** | Lab 1: Definition, History and development, Classical examples, Factors governing biological control |
| **Week 2** | Lab 2: Five Major Types of Species (Natural enemies) |
| **Week 3** | Lab 3: Interactions; Examples of Symbiotic Species, Parasitism, Mutualism, Commensalism, Competition, |
| **Week 4** | Lab 4: Sampling Methods and Tools |
| **Week 5** | Lab 5: Mid Exam 1 |
| **Week 6** | Lab 6: Biological Control of Weeds |
| **Week 7** | Lab 7: Biological Control of Nematodes |
| **8Week** | Lab 8: Biological control of Fungi |
| **9Week** | Lab 9: Biological control of filamentous Algae |
| **Week 10** | Lab 10: Biological Control of Plant Pathogens |
| **Week 11** | Lab 11: Mid Exam 2 |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | **Text** | **Available in the Library?** |
|---|---|---|
| **Required Texts** | - Biological Control: Benefits and Risks. 1995. Heikki M. T. Hokkanen and James M. Lynch. Cambridge, University Press. | No |

| | | |
|---|---|---|
| | - Biological Control A Global Perspective. 2007. Charles Vincent, Mark S.Goettel, and George Lazarovits. CABI, UK, USA. | |
| **Recommended Texts** | - Plant Defence: Biological Control. 2012. Jean Michel Merillon & Kishan Gopal Ramawat. Springer, Dordrecht Heidelberg London New York<br><br>-Trophic and Guild in Biological Control. 2006. Jacques Brodeur and Guy Boivin. Springer. Dordrecht, The Netherlands. | No |
| **Websites** | https://biocontrol.entomology.cornell.edu/links.php<br><br>https://cals.cornell.edu/new-york-state-integrated-pest-management/eco-resilience/biocontrol<br><br>https://www.youtube.com/channel/UCJlzzBwuorwLbviAhEgbnqQ | |

## Grading Scheme

مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to

condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Phycology | | | **Module Delivery** | |
| **Module Type** | Core | | | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar | |
| **Module Code** | 18BIOT-14 | | | | |
| **ECTS Credits** | 5 | | | | |
| **SWL (hr/sem)** | 125 | | | | |
| **Module Level** | UG | | **Semester of Delivery** | 4 | |
| **Administering Department** | Biotechnology | | **College** | College of Science | |
| **Module Leader** | Alhan Muhamed | | **e-mail** | alhanalwan@uodiyala.edu.iq | |
| **Module Leader's Acad. Title** | Assistant professor | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 30/06/2024 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |

| | | | |
|---|---|---|---|
| **Co-requisites module** | None | **Semester** | |

| **Module Aims, Learning Outcomes and Indicative Contents**<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | 1. This course deals with the basic concept of Phycology.<br>2. To understand the role of Phycology in biotechnology field. |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | To recognize the :<br>-1 Older classification systems of algae, fossils records, distribution of algae, forms of algal bodies.<br>-2 Cell structures of algae, Plastids, Pigments, Storage products,Types of flagella, types of growth, Reproduction and life cycles<br>-3 Newer classification system of algae into ten divisions, Division 1: Cyanophycophyta, Cell structure, morphology, Reproduction, Classification.<br>-4 Division2: Chlorophycophyta, main characteristics, Classification into 15 orders with examples.<br>-5 Division 3: Charophycophyta and Division 4: Euglenophycophyta, Devision 5 : main characteristics, Classification,with examples.<br>-6 Division: 5 Xanthophycophyta: Classification of this division into three classes, Class 1: Chrysophycea, Class 2: Xanthophyceae Class 3: Bacillariophyceae While consider as division in other classification system.<br>-7 Division 8: Phaeophycophyta, general characteristics, Reproduction organs, Growth, and classification.<br>-8 Division 9: Pyrrhophycophyta: general characteristics,and classification with examples.<br>-9 Division 10: Rhodophycophyta: general characteristics**,** Commercial utilization of red algal mucilages, Application in Biotechnology, Classification with examples. |
| **Indicative Contents**<br>المحتويات الإرشادية<br>يتضمن الكلمات المفتاحية المهمة للمحاضرات | Indicative content includes the following:<br>- Older classification systems for algae, Fossil recode, Distribution, Algal forms<br>- Growth and reproduction, Cell structure, Pigments and chloroplast, storage product and life cycles.<br>- Others classification systems, Cyanophyta, Cholorophyta<br>- Charophyta and Euglenophyta.<br>- Xanthophytan, Chrysophyta, and Bacillariophyta.<br>- Phaeophyta and Pyrrhophyta<br>- Rhodophyta and its application in Biotechnology. |

| | |
|---|---|

## Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

| | |
|---|---|
| **Strategies** | Type something like: Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the collection of different samples, media preparation. Isolation and primitive identification according to the acquired skills from the theoretical and practical information through lectures and Lab. |

## Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.26 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 46 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3.06 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 125 | | |

## Module Evaluation
تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 2, 10 and 11 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4, 6 and 7 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| **Summative assessment** | **Midterm Exam** | 2 hr | 10% (10) | 7 | LO # 1-7 |
| | **Final Exam** | 2hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| **Week 1** | Introduction , Old classification systems, Fossils record, Occurrence and distribution, Alga forms |
| **Week 2** | Cell structure, Cell wall, Protoplast, Plastid and pigments, Storage products |
| **Week 3** | Nucleus, Flagella, Growth in algae, Reproduction and life cycles |
| **Week 4**<br>**Week 5** | Others classification systems, Division: Cyanophycophyta, General characteristics, Morphology, Cell wall structure and gliding, Protoplasmic structures, Pigments, Akinetes , Heterocysts , Reproduction, ,Occurrence and Habitat, Classification |
| **Week 6** | Division: Chlorophycophyta, Introduction, Occurrence and Habitat , General characteristics, Cell fine structure, Phototaxis and eyespots, Classification, Order: Chlorellales, Order: Vovocales |
| **Week 7** | Mid examine |
| **Week 8**<br>**Week 9** | Genus: Volvox, Order: Tetrasporales, Order: Ulothrichales, Order: Oedogoniales, Order: Cladophorales, Order: Zygnematales, Order: Siphonocladales |
| **Week 10** | Division: Charophycophyta, Order: Charales, General characteristics, Growth, Reproduction |
| **Week 11** | Division: Euglenophycophyta, General characteristics, Cell structure and Nutrition,Classification, Order: Euglenales, Genus: Euglena, Description under light and electronic Microscope. |
| **Week 12** | Division: Xanthophycophyta, Introduction, General characteristics , Classification, Order: Mischococcales, Order: Tribonematales, Order: Botrydiales, Order: Vaucheriales |
| **Week 13** | Division: Phaeophycophyta ,General characteristics, Reproduction, Life cycle and Growth, Classification, Order:Ectocarpales , Family: Ectocarpaceae |
| **Week 14** | Division: Pyrrhophycophyta, General characteristics, Classification, Toxins, Red tides and its csuses. |
| **Week 15** | Division: Rhodophycophyta, General characteristics, Commercial utilization of red algal mucilages,Reproductive structures, Classification, Order: Ceramiales |
| **Week 16** | **Preparatory week before the final Exam** |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

| | Material Covered |
|---|---|
| **Week 1** | Lab 1: Algal forms |
| **Week 2** | Lab 2: Taxonomic and collection methods for algae |
| **Week 3** | Lab 3: Division: Cyanophyta |
| **Week 4** | Lab 4: Chlorophyta part1 |
| **Week 5** | Lab 5: Cholorophyta part 2 |
| **Week 6** | Lab 6: Euglanophyta and Pyrrhophyta |
| **Week 7** | Lab 7: Xanthophyta and Chrysophyta |
| **Week 8** | Lab 8: Phaeophyta and Bacillariophyta |
| **Week 9** | Lab 9: Rhodophyta |

## Learning and Teaching Resources
مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Phycology, by Robert Edward Lee, Fourth Edition, Cambridge 2008. | No |
| **Recommended Texts** | | No |
| **Websites** | https://www.twinkl.com | |

## Grading Scheme
مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** – Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

## Module Information
معلومات المادة الدراسية

| | | | |
|---|---|---|---|
| **Module Title** | Biochemistry2 | **Module Delivery** | |
| **Module Type** | Core | ☒ **Theory**<br>☒ **Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>☒ Seminar | |
| **Module Code** | BIOT-1419 | | |
| **ECTS Credits** | 5 | | |
| **SWL (hr/sem)** | 125 | | |
| **Module Level** | UG | **Semester of Delivery** | 4 |
| **Administering Department** | Biotechnology | **College** | College of Science |
| **Module Leader** | Ibtihal Sabri | **e-mail** | dr.ebtehal@uodiyala.edu.iq |
| **Module Leader's Acad. Title** | Lecturer | **Module Leader's Qualification** | Ph.D. |
| **Module Tutor** | Name (if available) | **e-mail** | E-mail |
| **Peer Reviewer Name** | | **e-mail** | |
| **Scientific Committee Approval Date** | 01/06/2024 | **Version Number** | 1.0 |

## Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

| | | | |
|---|---|---|---|
| **Prerequisite module** | Biochemistry1 | **Semester** | 3 |
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

| | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | Aims of biochemistry to study biomolecules and their components such as enzymes, proteins, hormones, antibiotics, and organic acids, and to identify -1 |

| | |
|---|---|
| | their importance and role in the bodies of living organisms and to exploit them in diagnosing and treating diseases and abnormalities that afflict livingthings<br>-2 Acquisition of practical, scientific, and laboratory information about the basics of biochemistry, which plays a very large role in the medical and pharmaceutical sectors and in many very important jobs. These fields or specializations include the industrial, health, academic, and many other fields.<br>-3 Identify chemical compounds and understand the biochemical reactions that take place in the human body.<br>-4 Understanding of the chemical properties of biomolecules and the ability to use and combine biochemical techniques with genetics and physical biology techniques as well as molecular biology.<br>-5 The ability to diagnosis of diseases through blood indicators and give the ability to understand normal and pathological phenomena in the human body through theoretical and practical lessons.<br>-6 Conducting advanced research in the fields of basic and clinical biochemistry that<br>Serve the community. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | -1 Identify the principles of bioenergetics and enzyme catalysis and understand the behavior of enzymes, by describing the catalytic properties and ways to regulate these properties.<br>-2 Understanding the chemical reactions catalyzed by enzymes that contribute to all biochemical processes within an organism.<br>-3 Carbohydrates - glucose provides energy for the brain and ½ of energy for muscles and tissues, glycogen is stored glucose, glucose is immediate energy, glycogen is reserve energy<br>-4 Carbohydrates also help to digest protein and fat.<br>-5 Carbohydrates also play a vital part of the metabolism and oxidation of protein, Carbs help feed the brain and nervous system and helps keep the body lean.<br>-6 Define the major pathways of intermediary metabolism of biomolecules, and discuss their bioenergetics, physiological adaptation, metabolic and main hormonal regulation.<br>-7 Understanding major catabolic and anabolic pathways in metabolism of carbohydrates and lipids<br>-8 Explain the key regulatory points and pathways in metabolic hormonal signaling in metabolic pathways. understanding<br>-9 Explain molecular mechanisms underlying major inherited diseases of metabolism. |
| **Indicative Contents**<br><br>المحتويات الإرشادية<br><br>يتضمن الكلمات المفتاحية المهمة للمحاضرات | Indicative content includes the following.<br><br>Enzymes, Mechanism of enzymes action, Factors Affecting the Velocity of Enzyme Reaction, Enzyme kinetics, Enzyme inhibition.<br><br>Metabolism, Carbohydrates metabolism, glycolysis, Citric acid cycle. |

| | |
|---|---|
| | Gluconeogenesis, Glycogen metabolism – Glycogenesis and Glycogenolysis.<br><br>Lipid metabolism, Fatty acid oxidation, regulation of beta oxidation. |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Biochemistry teaching strategy for biotechnology specialty students, conducted through an improved lecture format with a brief content and multimedia courseware. This is done By using the brainstorming method, , and using the discussion method to stimulate thinking and participation of students and to provide an opportunity for questions and discussion, while respecting their opinions and suggestions, and this method helps in developing the student's personality cognitively, emotionally and skillfully. Also using the methods of thinking maps, it is an effective teaching strategy in representing knowledge through schematic forms that link concepts to each other. Concept maps are used to present new information, discover relationships between concepts, deepen understanding, summarize information, and evaluate the lesson. Encouraging students to prepare reports and present seminars with conducting tests to assess students' understanding and levels. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.26 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 46 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3.06 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 125 | | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| Formative assessment | Quizzes | 2 | 10% (10) | 5, 10 | LO #1, 2, 8 and 11 |
| | Assignments | 2 | 10% (10) | 2, 12 | LO # 3, 4, 6 and 5 |
| | Projects / Lab. | 1 | 10% (10) | Continuous | All |
| | Report | 1 | 10% (10) | 13 | LO # 5, 9 and 10 |
| Summative assessment | Midterm Exam | 2hr | 10% (10) | 7 | LO # 1-7 |
| | Final Exam | 2hr | 50% (50) | 16 | All |
| Total assessment | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| Week 1 | Enzymes –Definition –Cofactors -Location of enzyme - How Enzymes work |
| Week 2 | Mechanism of enzymes action -Enzymes classification |
| Week 3 | Specificity of enzyme action - Factors Affecting the Velocity of Enzyme Reaction |
| Week 4 | Enzyme kinetics - Enzyme inhibition - Allosteric enzyme-Isozymes |
| Week 5 | Metabolism - Definition-Carbohydrates metabolism - Digestion of carbohydrate |
| Week 6 | Glycolysis - Reaction of glycolysis - Regulation of glycolysis |
| Week 7 | Midterm Exam |
| Week 8 | Citric acid cycle - Reaction and significance of TCA- Regulation of TCA |
| Week 9 | Gluconeogenesis- Definition-Location-Characteristic- Reaction of gluconeogenesis- Regulation and significance |

| | |
|---|---|
| **Week 10** | Glycogen metabolism – Glycogenesis – Definition-Location-Characteristic - Reaction of glycogenesis |
| **Week 11** | Glycogenolysis - Definition-Location-Characteristic - Reaction of glycogenolysis |
| **Week 12** | Regulation of glycogenesis and glycogenolysis |
| **Week 13** | Lipid metabolism - Digestion of lipid -Fatty acid oxidation . |
| **Week 14** | Reaction and regulation of beta oxidation . |
| **Week 15** | **Preparatory week** |
| **Week 16** | **final Exam** |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

| | **Material Covered** |
|---|---|
| **Week 1** | Lab 1: Blood-Types and serum, plasma |
| **Week 2** | Lab 2: General urine examination |
| **Week 3** | Blood glucose\Lab 3: |
| **Week 4** | Lab 4: Iipid profile , Cholesterol , Triglycerides |
| **Week 5** | Lab 5: Uric acid |
| **Week 6** | Lab 6: Urea , Creatinine |
| **Week 7** | Lab 7: Total protein |
| **Week 8** | Lab 8 Liver enzymes |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Introduction to general organic and biochemistry<br>University of Illinois, Urbana-Champaign | Yes |
| **Recommended Texts** | Lippincott's<br>Illustrated Reviews: Biochemistry<br>ESSENTIALS OF BIOCHEMISTRY<br>Pankaja Naik PhD ,Professor and Head<br>Department of Biochemistry, MVPS Dr Vasantrao Pawar Medical College Nashik, Maharashtra , India | No |
| **Websites** | http://www.schoolarabia.net/kemya/kymia_hyatia/main.htm | |

## Grading Scheme

مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Histology and Microtechnique | | | **Module Delivery** | |
| **Module Type** | Core | | | ☒ **Theory**<br>☒ **Lecture**<br>☒ **Lab**<br>☐ Tutorial<br>☐ Practical<br>√ Seminar | |
| **Module Code** | 0BIOT-142 | | | | |
| **ECTS Credits** | 5 | | | | |
| **SWL (hr/sem)** | 251 | | | | |
| **Module Level** | UG | | **Semester of Delivery** | 4 | |
| **Administering Department** | Biotechnology | | **College** | College of Science | |
| **Module Leader** | Riyadh Hameed Nsaif | | **e-mail** | riyadhhameed@uodiyala.edu.iq | |
| **Module Leader's Acad. Title** | Assistant Professor | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Massar Hadi | | **e-mail** | Masarhadi@uodiyala.edu.iq | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2024 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Microtechnique, cytology | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | 1. The course trains students in the skills of taking samples, making animal histological specimens, and proficiently using microscopes and other laboratory machines.<br>2. To provide knowledge of the preparation of tissues for light and fluorescence microscopy<br>3. To provide knowledge of the histological structure of tissues and organs at both the light and electron microscopic level.<br>4. To provide a good grounding in histological/histopathological techniques.<br>5. To the knowledge of laboratory management principles, quality management, and safety procedures in the histology laboratory. |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | 1. Receive, prepare, and process specimens for histopathological investigation. To include dissection, tissue selection cutting, fixation, and staining, as appropriate.<br>2. Select the appropriate demonstration technique in the investigation of representative histopathology specimens.<br>3. Use microscopic examination techniques to investigate histopathological specimens.<br>4. Recognize normal cellular morphology of representative tissues and organs and common pathobiological processes associated with them.<br>5. Comply with quality assurance processes associated with histopathological investigations.<br>6. Describe the receipt, preparation, and processing of specimens for histopathological diagnosis.<br>7. Describe the appropriate demonstration technique as part of the diagnostic process.<br>8. Explain and evaluate microscopical examination techniques. |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following.<br>• Compound Microscope |

| | |
|---|---|
| يتضمن الكلمات المفتاحية المهمة للمحاضرات | • Non –sectioning methods<br>• Paraffin methods<br>• Dissection<br>• Epithelial tissues<br>• Connective tissues<br>• Cartilage<br>• Bone<br>• Nervous tissue<br>• Muscular tissue |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | 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 the following:<br>- Providing students with the basics and additional topics related to the pre-skills education outcomes to solve scientific problems<br>- Students' participation during the lecture to solve some scientific issues<br>- Summer training |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.26 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 46 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3.06 |
| **Total SWL (h/sem)** | 125 | | |

| | |
|---|---|
| الحمل الدراسي الكلي للطالب خلال الفصل | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| Formative assessment | Quizzes | 2 | 10% (10) | 5, 10 | LO #1, 2, 10 and 11 |
| | Assignments | 2 | 10% (10) | 2, 12 | LO # 3, 4, 6 and 7 |
| | Projects / Lab. | 1 | 10% (10) | Continuous | All |
| | Report | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| Summative assessment | Midterm Exam | 2 hr | 10% (10) | 7 | LO # 1-7 |
| | Final Exam | 2hr | 50% (50) | 16 | All |
| Total assessment | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| Week 1 | Definition & laboratory rules history, microscopy, types of microscopes, microscope technique, None sectioning methods for samples preparation |
| Week 2 | Sectioning methods (Paraffin) Fixation, washing, dehydration, clearing, Embedding, , advantages and disadvantages |
| Week 3 | Sectioning, microtomes, types of microtomes, frozen sections, mounting, Staining, classification of stains, labeling, Immunological staining |
| Week 4 | Introduction in histology, Components of tissues, basic types of tissues, Epithelial tissue, classification, types |

| | |
|---|---|
| **Week 5** | Epithelial cell polarity, Specialization of the apical cell surface, Glandular epithelium, classification. Glands classification |
| **Week 6** | Connective tissues, components, proper conn. Tissue, Specialize connective tissues, adipose tissue, Cartilage |
| **Week 7** | **MID EXAM** |
| **Week 8** | Specialize in connective tissues, Cartilage, |
| **Week 9** | Bone, Process of Bone Formation |
| **Week 10** | Histology of the skin, cells, layers, |
| **Week 11** | Muscular system (structure. Arteries and veins sections |
| **Week 12** | Nervous system , component, neuron, supporting cells |
| **Week 13** | Digestive tract, Sections |
| **Week 14** | Liver, spleen, Pancreas, |
| **Week 15** | Urinary system, kidney |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

| **Week** | **Material Covered** |
|---|---|
| **Week 1** | Lab1: Compound Microscope- Inverted microscope, Fluorescence microscopy, Wet mounts slide |
| **Week 2** | Lab 2: The different methods in microscopic slide preparation- Dry Mount, Wet Mount, Squash Slides, Staining, Blood smear: Types of stains: Some blood abnormalities distinguished by a blood smear: Preparation of Peripheral Blood Smear: Leishman's Stain: |
| **Week 3** | Lab 3**:** Paraffin methods, killing process, Gross Examination, Fixation, Type of fixative solutions, Dehydration, Paraffin Embedding, Blocking, Sectioning, Staining, Mounting |
| **Week 4** | Lab 4-: Mouse Dissection |
| **Week 5** | Exam |

| | |
|---|---|
| **Week 6** | Lab 5: Epithelial tissues |
| **Week 7** | Lab 6: Glands |
| **Week 8** | Lab 7: Connective tissues: Part 1 |
| **Week 9** | Lab 8: Connective tissues: Part 2 |
| **Week 10** | Lab 9: Cartilage |
| **Week 11** | Lab 10: Bone |
| **Week 12** | Lab 11: Liver, spleen |
| **Week 13** | Lab 12: Pancreas, Kidney |
| **Week 14** | Exam |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | التحضيرات المجهرية / كواكب المختار<br>Microtechnique /Gray /1977, A text and atlas / Ross and Pawlina /2006<br>المجلات العلمية الرصينة<br>محاضرات الهيئة التدرسية | Yes |
| **Recommended Texts** | Junqueira's Basic Histology Text & Atlas (14th ed.) Anthony L Mescher ..2016 | No |
| **Websites** | Histology guide<br>http://www.histologyguide.com/about-us/atlas-of-human-histology.html<br>An Atlas of Histology<br>https://www.springer.com/gp/book/9780387949543 | |

## Grading Scheme

مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| Success Group (50 - 100) | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C** - Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D** - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E** - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| Fail Group (0 – 49) | **FX** – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM
# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | |
|---|---|---|---|---|
| **Module Title** | **Biosafety** | | **Module Delivery** | |
| **Module Type** | **Support** | | ☒ **Theory**<br>☒ **Lecture**<br>☐Lab<br>☐ Tutorial<br>☐ Practical<br>☒ **Seminar** | |
| **Module Code** | **BIOT-1421** | | | |
| **ECTS Credits** | **2** | | | |
| **SWL (hr/Sem)** | **100** | | | |
| **Module Level** | UG | **Semester of Delivery** | 4 | |
| **Administering Department** | Biotechnology | **College** | College of Science | |
| **Module Leader** | Shaymaa Hatem Al-Majmaie \| | **e-mail** | shaymaa@uodiyala.edu.iq | |
| **Module Leader's Acad. Title** | Assistant Professor | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2024 | **Version Number** | | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | 1. Prepare students to acquire knowledge and understanding of the conceptual framework and applications of biotechnology and nanotechnology.<br>2. Prepare students to acquire knowledge and understanding of industrial, environmental, and food microbiology.<br>3. Prepare students to acquire knowledge and understanding of genetics, genetic engineering, and cellular genetics.<br>4. Prepare students to acquire knowledge and understanding of plant, plant tissue, and animal biology.<br>5. Prepare students to acquire knowledge and understanding of diseases, immunity, and pathogenic bacteria.<br>6. Prepare students to acquire knowledge and understanding of cell biology and microbiology standards.<br>7. Prepare students to acquire knowledge and understanding of biological statistics and the English language. |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | 1. Understand the principles and importance of biosafety and biosecurity in handling microorganisms and biological materials.<br>2. Demonstrate knowledge of the different containment levels and appropriate safety measures for working with various biological agents.<br>3. Apply proper techniques and protocols for handling, storing, and disposing of biological materials to minimize risks and prevent accidental release.<br>4. Identify potential hazards and assess risks associated with specific |

| | |
|---|---|
| | biological experiments or procedures.<br>5. Implement effective measures to mitigate risks and ensure the safety of researchers, the environment, and the community.<br>6. Comply with relevant regulations, guidelines, and ethical considerations in the field of biosafety and biosecurity.<br>7. Recognize the significance of early detection and diagnosis of genetic diseases through genetic engineering and immunological techniques.<br>8. Understand the principles and applications of tissue culture in the field of animal cell biology.<br>9. Evaluate and implement appropriate measures to maintain the security and integrity of biological materials and prevent unauthorized access or misuse.<br>10. Communicate and collaborate effectively within a biosafety framework, demonstrating an understanding of the importance of clear communication and teamwork in maintaining a safe and secure laboratory environment |
| **Indicative Contents**<br>المحتويات الإرشادية | 1. Introduction to biosafety and biosecurity: Concepts, importance, and historical background.<br>2. Biosafety levels and containment systems: Overview of different biosafety levels and their associated safety measures and equipment.<br>3. Risk assessment and management: Techniques for identifying, assessing, and mitigating risks in biological research and laboratory settings.<br>4. Safe handling and manipulation of biological materials: Proper techniques for handling, storing, and transporting microorganisms, genetically modified organisms (GMOs), and other biological agents.<br>5. Personal protective equipment (PPE) and laboratory safety protocols: Understanding and implementing appropriate PPE and following established safety protocols.<br>6. Biohazardous waste management: Proper disposal methods for biohazardous materials and adherence to waste management regulations.<br>7. Laboratory design and engineering controls: Considerations for designing and equipping a biosafety laboratory, including ventilation systems, containment facilities, and access controls.<br>8. Security measures and biosecurity protocols: Ensuring the protection and security of biological materials, including strategies for preventing unauthorized access and potential misuse.<br>9. Genetic engineering and molecular diagnostics: Applications of genetic engineering techniques and molecular diagnostics in the early detection and diagnosis of genetic diseases.<br>10. Tissue culture techniques: Principles and applications of tissue culture in the context of animal cell biology and biotechnology.<br>11. Regulatory frameworks and ethical considerations: Understanding and complying with relevant regulations, guidelines, and ethical principles in biosafety and biosecurity practices. |

| | |
|---|---|
| | 12. Communication and teamwork in biosafety: Effective communication, collaboration, and teamwork within a biosafety framework, including reporting incidents and sharing information. |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Demonstration and Practice: Provide hands-on demonstrations and practice opportunities for students to learn and apply biosafety and biosecurity techniques.<br>Case Studies: Use real-life examples and scenarios to help students understand the practical application of biosafety and biosecurity measures.<br>Visual Aids and Multimedia: Utilize visual aids and multimedia resources to enhance understanding of biosafety and biosecurity concepts. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 48 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 3.2 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 52 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3.46 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 100 | | |

| Module Evaluation<br>تقييم المادة الدراسية | | | | |
|---|---|---|---|---|
| | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |

| | | | | | |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5 and 10 | LO #1, #2 and #10, #11 |
| | **Assignments** | 2 | 10% (10) | 2 and 12 | LO #3, #4 and #6, #7 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 13 | LO #5, #8 and #10 |
| **Summative assessment** | **Midterm Exam** | 2hr | 10% (10) | 7 | LO #1 - #7 |
| | **Final Exam** | 3hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

| **Delivery Plan (Weekly Syllabus)**<br>المنهاج الاسبوعي النظري | |
|---|---|
| **١** | **Material Covered** |
| **Week 1** | Introduction to biosafety |
| **Week 2** | Introduction to biosecurity |
| **Week 3** | Chemical hazardous part 1 |
| **Week 4** | Chemical hazardous part 2 |
| **Week 5** | exam |
| **Week 6** | Radiation hazardous |
| **Week 7** | Waste management p1 |
| **Week 8** | Waste management p2 |
| **Week 9** | Shipping of hazard materials p1 |
| **Week 10** | Shipping of hazard materialsp2 |
| **Week 11** | BIOSECURITY |
| **Week 12** | BIOSECURTY -2 |
| **Week 13** | Dual Use Research of Concern (DURC) |

| | |
|---|---|
| **Week 14** | Dual Use Research of Concern (DURC) 2 |
| **Week 15** | exam |
| **Week 16** | Preparatory week before the final Exam |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | Biological Safety: Principles and Practices,<br>Dawn P. Wooley (Editor), 5th Edition | Yes |
| **Recommended Texts** | Biological Safety: Principles and Practices, 5th Edition<br>Dawn P. Wooley (Editor), Karen B. Byers | No |
| **Websites** | | |

# GRADING SCHEME
مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | A - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | B - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | C - Good | جيد | 70 - 79 | Sound work with notable errors |
| | D - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | E - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | FX - Fail | راسب - قيد المعالجة | (45-49) | More work required but credit awarded |
| | F - Fail | راسب | (0-44) | Considerable amount of work required |

***Note***:
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# المرحلة الثالثة

| |
|---|
| **1. اسم المقرر** |
| **مضادات حياتية** |
| **2. رمز المقرر** |
| |
| **3. الفصل / السنة** |
| **نظام فصلي / 2023 -2024** |
| **4. تاريخ إعداد هذا الوصف** |

| | |
|---|---|
| 2024 /4 / 20 | |
| 5. أشكال الحضور المتاحة | |
| الزامي | |
| 6. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي) | |
| 4 اسبوعيا ( ساعتان الجزء النظري + ساعتان الجزء العملي ) / عدد الوحدات = 3 | |
| 7. اسم مسؤول المقرر الدراسي ( اذا اكثر من اسم يذكر) | |
| الاسم: أ. م. د زينب عامر حاتم اليميل zainabamer@uodiyala.edu..iq: | |
| 8. اهداف المقرر | |
| اهداف المادة الدراسية | 1. تعريف الطالب بمادة المضادات الحياتية من حيث تركيبها واستخدامها وعلاقتها بمعالجة الحالات المرضية من خلال التعرف على الانواع البكتيرية وتشخيصها ومعرفة نوع الاصابة المرضية وبالتالي معرفة استخدام النوع المناسب من المضادات الحياتية لعلاج هذه الحالة المرضية<br>2. تعريف الطالب بالطرق الكلاسيكية لتشخيص الاصابات المرضية وبالتالي معرفة انواع المضادات المختلفة التي تعمل على اجزاء مختلفة من البكتريا مثل الجدار الخلوي والغشاء السايتوبلازمي وتركيب الاحماض النووية والتطورات التقنية التي تجري على هذا العلم مثل الطرق الكيميائية والجزيئية . |
| 9. استراتيجيات التعليم والتعلم | |
| الاستراتيجية | يجب ان يكون الخريج قادر على معرفة وفهم كل مما ياتي: 1- تغطية اساسيات المضادات<br>2- الفهم الكامل لكيفية عمل المضادات الحياتية بكافة اشكالها تجاه انواع البكتريا والطفيليات والفطريات والفايروسات<br>3- التعرف على انواع المضادات الحياتية |

| | |
|---|---|
| 4- التعرف على ميكانيكيات المقاومة للمضادات الحياتية | |

**10. بنية المقرر**

| الأسبوع | الساعات | مخرجات التعلم المطلوبة | اسم الوحدة او الموضوع | طريقة التعلم | طريقة التقييم |
|---|---|---|---|---|---|
| الاول | 2 ن + 2 ع | فهم المبادئ والاساسيات المهمة النظرية والعملية المتعلقة بالمادة | Introduction to Antimicrobial and Drug Therapy | اسلوب المحاضرات والسيمنرات | امتحانات يومية |
| الثاني | 2 ن + 2 ع | فهم المبادئ والاساسيات المهمة النظرية والعملية المتعلقة بالمادة | Sources, Mechanism of action of Antibiotics | " | " |
| الثالث | 2 ن + 2 ع | " | Action on nucleic acids | " | " |

| | | | | | |
|---|---|---|---|---|---|
| الرابع | 2 ن + 2 ع | ″ | Action on proteins | ″ | ″ |
| الخامس | 2 ن + 2 ع | ″ | Action on cell wall | ″ | ″ |
| السادس | 2 ن + 2 ع | امتحان اول | First Exam | قاعة الاختبار للامتحان النظري و سبوتات بالنسبة للجزءالعملي | درجة الطالب في الامتحان اضافة لمعدل الامتحانات اليومية |
| السابع | 2 ن + 2 ع | فهم المبادئ والاساسيات المهمة النظرية والعملية المتعلقة بالمادة | Pharmacology of Antibiotics& hypersensitivity | اسلوب المحاضرات والسيمينارات | الامتحانات اليومية |
| الثامن | 2 ن + 2 ع | فهم المبادئ والاساسيات المهمة النظرية والعملية المتعلقة بالمادة | Pharmacokinetic of Antibiotics | ″ | ″ |
| التاسع | 2 ن + 2 ع | ″ | Bacteriostatic vs Bactericidal, MIC | ″ | ″ |
| العاشر | 2 ن + 2 ع | ″ | Antimetabolites, Toxicity of Antibiotics | ″ | ″ |
| الحادي عشر | 2 ن + 2 ع | ″ | Mechanism of resistance to antibiotics | ″ ا | ″ |

| | | | | | |
|---|---|---|---|---|---|
| | | | Future Antibiotics | | |
| الاثني عشر | 2 ن + 2 ع | " | Toxins-I: Biotoxins | " | " |
| الثالث عشر | 2 ن + 2 ع | " | Toxin-II: Bacterial Toxins | " | " |
| الرابع عشر | 2 ن + 2 ع | امتحان ثاني | Second Exam | قاعة الاختبار للامتحان النظري و سبوتات بالنسبة للجزءالعملي | درجة الطالب في الامتحان اضافة لمعدل الامتحانات اليومية |
| الخامس عشر | 2 ن + 2 ع | امتحان نهاية الكورس | Final Exam. | قاعة الاختبار للامتحان النظري و سبوتات بالنسبة للجزءالعملي | درجة الطالب في الامتحان |

**11. تقييم المقرر**

| | | | | |
|---|---|---|---|---|
| | الجزء النظري | الامتحان النهائي / 34 درجة | درجة السعي / 15 درجة امتحان فصل اول<br>15 درجة امتحان فصلي ثاني 4 درجات امتحانات يومية | |
| | الجزء العملي | الامتحان النهائي / 16 درجة | درجة السعي / 6 درجة امتحان فصل اول 6 درجة امتحان فصلي ثاني 4 درجات امتحانات يومية | |

**12. مصادر التعلم والتدريس**

| | |
|---|---|
| الكتب المقررة المطلوبة ( المنهجية أن وجدت ) | Text books |

| | |
|---|---|
| المراجع الرئيسة ( المصادر) | Walsh, C. (2003). Antibiotics: actions, origins, resistance. American Society for Microbiology (ASM). .1<br>Bhattacharjee, M. K. (2016). Chemistry of antibiotics and related drugs (Vol. 219). Cham: Springer .2<br>Shareef, F.M., 2012. Medical Fungi, Ist. ed. AlThakera Publishing & Distributors, Irbil, Iraq, Pp 608 .3<br>Description of medical fungi 2nd ed.(2016) Editor:Ellis*et al* .4 |
| الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير.. ) | 1 Text books |
| المراجع الإلكترونية ، مواقع الانترنيت | https://www.futurelearn.com/subjects/healthcare-medicine-courses/antimicrobial-and-antibiotic-resistance |

| |
|---|
| 1. اسم المقرر |
| |
| 2. رمز المقرر |
| |
| 3. الفصل / السنة |
| نظام فصلي / 2023 -2024 |
| 4. تاريخ إعداد هذا الوصف |
| 23 / 4/ 2024 |

| | |
|---|---|
| **5. أشكال الحضور المتاحة** | |
| **الزامي** | |
| **6. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي)** | |
| **4 اسبوعيا ( ساعتان الجزء النظري + ساعتان الجزء العملي ) / عدد الوحدات = 3** | |
| **7. اسم مسؤول المقرر الدراسي ( اذا اكثر من اسم يذكر)** | |
| **الاسم: ا م د علياء معن عبد الحميد اليميل : maan.alyaa@yahoo.com** | |
| **8. اهداف المقرر** | |
| **اهداف المادة الدراسية** | **البيولوجي الجزيئي وعلاقته بالعلوم الاخرى**<br>**تركيب وتخليق الدنا والرنا**<br>**تضاعف الدنا والانزيمات ذات العلاقة في خلايا حقيقية وبدائية النواة**<br>**استنساخ الرنا بمراحله الثلاثة في خلايا حقيقية وبدائية النواة**<br>**تخليق وبناء الرنا بانواعه الثلاثة**<br>**البروتينات تعريفها و انواعها والبروتينات المرتبطة بالاحماض النووية**<br>**تصنيع البروتين وترجمة الرنا في خلايا حقيقية وبدائية النواة**<br>**الجينات والتعبير الجيني وتنظيم تصنيع البروتين** |
| **9. استراتيجيات التعليم والتعلم** | |
| **الاستراتيجية** | **يجب ان يكون الخريج قادر على معرفة وفهم كل مما ياتي:**<br>**الفكرةالمركزية للبيولوجي الجزيئي وعناصرها**<br>**التركيب الكيميائي والفيزيائي للمادة الوراثية (DNA)**<br>**التركيب الكيميائي للحمض النووي RNA وانواعه**<br>**الأدلة على أن حمض DNA هو المادة الوراثة**<br>**عملية تضاعف المادة الوراثية في الكائنات حقيقية النواة**<br>**التعبير الجيني Gene Expression (الاستنساخ والترجمة)**<br>**فعالية التنظيم الجيني Operon**<br>**الطفرات الوراثية**<br>**انظمة اصلاح DNA** |

## 10. بنية المقرر

| الأسبوع | الساعات | مخرجات التعلم المطلوبة | اسم الوحدة او الموضوع | طريقة التعلم | طريقة التقييم |
|---|---|---|---|---|---|
| الاول | 2 ن + 2 ع | التعرف على الاجهزة المستخدمة في المختبر وطرق استخدامها | Identify the equipment used in the laboratory and how to use it | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الثاني | 2 ن + 2 ع | التعرف على طرق تحضير المحاليل المولارية والعيارية | Learn about methods for preparing molar and standard solutions | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الثالث | 2 ن + 2 ع | تحضير الدنا الجينومي من خلايا بدائية النواة | Preparation of genomic DNA from prokaryotic cells | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الرابع | 2 ن + 2 ع | تحضير الدنا الجينومي من خلايا حقيقية النواة | Preparation of genomic DNA from eukaryotic cells | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الخامس | 2 ن + 2 ع | امتحان الفصل الاول | Exam. | سبوتات | امتحانات يومية |

| | | | | | |
|---|---|---|---|---|---|
| السادس | 2 ن + 2 ع | الترحيل الكهربائي للدنا المستخلص من التجارب على هلام الاكاروز وقياس الوزن الجزيئي | Electrophoresis of DNA extracted from experiments on agarose gels and measurement of molecular weight | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| السابع | 2 ن + 2 ع | دراسة خصائص الدنا مثل النقاوة وطيف الامتصاص | Study of DNA properties such as purity and absorption spectrum | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الثامن | 2 ن + 2 ع | تاثير بعض العوامل على استقرارية الدنا | The effect of some factors on DNA stability | البوربوينت + توفر المواد الخاصه بذلك | امتحانات يومية |
| التاسع | 2 ن + 2 ع | تحضير الرنا من الخميرة | Preparation of RNA from yeast | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| العاشر | 2 ن + 2 ع | ترحيل الرنا على هلام الاكاروز | Migration of RNA on an agarose gel | البوربوينت + توفر المواد الخاصه بذلك | امتحانات يومية |
| الحادي عشر | 2 ن + 2 ع | استخلاص البروتين وتنقيته من خلايا حقيقية وبدائية النواة | Protein extraction and purification from | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |

| | | | | | |
|---|---|---|---|---|---|
| | | eukaryotic and prokaryotic cells | | | |
| الاثني عشر | 2 ن + 2 ع | ترحيل البروتينات على هلام بولي اكراامايد | Migration of proteins on a polyacrylamide gel | البوربوينت + توفر المواد الخاصه بذلك | امتحانات يومية |
| الثالث عشر | 2 ن + 2 ع | الترحيل الكهربائي للدنا المستخلص من التجارب على هلام الاكاروز وقياس الوزن الجزيئي | Electrophoresis of DNA extracted from experiments on agarose gels and measurement of molecular weight | البوربوينت + توفر المواد الخاصه بذلك | امتحانات يومية |
| | | | | | |
| الرابع عشر | 2 ن + 2 ع | دراسة خصائص الدنا مثل النقاوة وطيف الامتصاص | Study of DNA properties such as purity and absorption spectrum | البوربوينت + توفر المواد الخاصه بذلك | امتحانات يومية |
| الخامس عشر | 2 ن + 2 ع | امتحان الفصل الثاني | Exam. | سبوتات | امتحانات يومية |

**11. تقييم المقرر**

| | | | |
|---|---|---|---|
| الجزء النظري | الامتحان النهائي / 34 درجة | درجة السعي / 14 درجة امتحان فصل اول 14 درجة امتحان فصلي ثاني 6 درجات امتحانات يومية | |
| الجزء العملي | الامتحان النهائي / 16 درجة | درجة السعي / 6 درجة امتحان فصل اول | |

| | | | | |
|---|---|---|---|---|
| | | | 6 درجة امتحان فصلي ثاني 4 درجات<br>امتحانات يومية | |

| 12. مصادر التعلم والتدريس | |
|---|---|
| الكتب المقررة المطلوبة ( المنهجية أن وجدت ) | الجزيئية أساسيات البيولوجيا |
| المراجع الرئيسة ( المصادر) | Diagnostic Molecular Biology |
| الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير.. ) | Molecular diagnostics |
| المراجع الإلكترونية ، مواقع الانترنيت | https://sigmaearth.com/ar/نظرة-عامة-على-البيولوجيا-الجزيئية / |

| 1. اسم المقرر |
|---|
| علم الوراثة الخلوية |
| 2. رمز المقرر |
| |
| 3. الفصل / السنة |
| نظام فصلي / 2023 -2024 |
| 4. تاريخ إعداد هذا الوصف |
| 28 / 4/ 2024 |
| 5. أشكال الحضور المتاحة |
| الزامي |
| 6. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي) |
| 4 اسبوعيا ( ساعتان الجزء النظري + ساعتان الجزء العملي ) / عدد الوحدات = 3 |

| 7. اسم مسؤول المقرر الدراسي ( اذا اكثر من اسم يذكر) | |
|---|---|
| الاسم: م.د نصير خليل عبيد : اليميل naseerkhalel@oudiyala.edu.iq | |
| 8. اهداف المقرر | |
| اهداف المادة الد ارسية | 1- تغطية أساسيات البيولوجيا الجزيئية للكائنات الحية حقيقية وبدائية النواة.<br>2 - الفهم الكامل لكيفية عمل خلايا الكائنات الحية على المستوى الجزيئي .<br>3 - أمكانية استخدام التطبيقات الحديثة لعلم الحياة الجزيئي لتطوير الصناعات الدوائية والطبية المختلفة. |
| 9. استراتيجيات التعليم والتعلم | |
| الاست ارتيجية | أ1- المباديء والاساسيات النظرية المتعلقة بالمادة العلمية للعلوم المعرفية<br>أ2- أسس البحث العلمي وطرق القياس والتحليل و ايجاد الحلول للمسائل العلمية أ3- اهمية الجوانب العلمية النظرية المرتبطة بتطبيقات العلوم المختلفة<br>أ4- المصطلحات العلمية واللغوية وتعريفها للمواد العلمية المختلفة<br>أ5- الطرائق المتعلقة بتحليل وتصميم التجارب العلمية للمواد العلمية المختلفة |

10. بنية المقرر

| الأسبوع | الساعات | مخرجات التعلم المطلوبة | اسم الوحدة او الموضوع | طريقة التعلم | طريقة التقييم |
|---|---|---|---|---|---|
| الاول | 2 ن + 2 ع | | Introduction to cytogenetics | البوربوينت | امتحانات يومية |

| | | | | | |
|---|---|---|---|---|---|
| الثاني | 2 ن + 2 ع | | Heterochromatin, euchromatin, and the nucleosome | البوربوينت | امتحانات يومية |
| الثالث | 2 ن + 2 ع | | Chromosome replication, segregation, and the centrosome | البوربوينت | امتحانات يومية |
| الرابع | 2 ن + 2 ع | | Numerical Abnormalities | البوربوينت | امتحانات يومية |
| الخامس | 2 ن + 2 ع | | Structural Chromosome Abnormalities | البوربوينت | امتحانات يومية |
| السادس | 2 ن + 2 ع | | First exam | البوربوينت | امتحانات يومية |
| السابع | 2 ن + 2 ع | | Mechanisms of | البوربوينت | امتحانات يومية |

| | | | | | |
|---|---|---|---|---|---|
| | | structural Abnormalities | | | |
| امتحانات يومية | البوربوينت | Sex chromosomes, X chromosome inactivation | | 2 ن + 2 ع | الثامن |
| امتحانات يومية | البوربوينت | Sex chromosome abnormalities | | 2 ن + 2 ع | التاسع |
| امتحانات يومية | البوربوينت | Sample collection, culture, and harvest | | 2 ن + 2 ع | العاشر |
| امتحانات يومية | البوربوينت | Banding Techniques | | 2 ن + 2 ع | الحادي عشر |
| امتحانات يومية | البوربوينت | Second Exam | | 2 ن + 2 ع | الاثني عشر |
| امتحانات يومية | البوربوينت | Introduction to cytogenetics | | 2 ن + 2 ع | الثالث عشر |

| | | | | | |
|---|---|---|---|---|---|
| الرابع عشر | 2 ن + 2 ع | | Heterochromatin, euchromatin, and the nucleosome | البوربوينت | امتحانات يومية |
| الخامس عشر | 2 ن + 2 ع | | Chromosome replication, segregation, and the centrosome | سبوتات | امتحانات يومية |

**11. تقييم المقرر**

| | | | |
|---|---|---|---|
| الجزء النظري | الامتحان النهائي / 34 درجة | درجة السعي / 14 درجة امتحان فصل اول 14 درجة امتحان فصلي ثاني 6 درجات امتحانات يومية | |
| الجزء العملي | الامتحان النهائي / 16 درجة | درجة السعي / 6 درجة امتحان فصل اول 6 درجة امتحان فصلي ثاني 4 درجات امتحانات يومية | |

**12. مصادر التعلم والتدريس**

| | |
|---|---|
| الكتب المقررة المطلوبة ( المنهجية أن وجدت ) | مدخل الى الوراثة الخلوية. اساسيات علم الوراثة الخالوية |
| المراجع الإلكترونية ، مواقع الانترنيت | |

| |
|---|
| **1. اسم المقرر** |
| **فايروسات ولقاحات** |
| **2. رمز المقرر** |
| |
| **3. الفصل / السنة** |
| **نظام فصلي / 2023 -2024** |
| **4. تاريخ إعداد هذا الوصف** |
| **22 / 4/ 2024** |
| **5. أشكال الحضور المتاحة** |
| **الزامي** |
| **6. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي)** |
| **4 اسبوعيا ( ساعتان الجزء النظري + ساعتان الجزء العملي ) / عدد الوحدات = 3** |
| **7. اسم مسؤول المقرر الدراسي ( اذا اكثر من اسم يذكر)** |
| **الاسم: م.د شهرزاد احمد خلف اليميل : shahrazadah.kh@gmail.com** |
| **8. اهداف المقرر** |

| | |
|---|---|
| **اهداف المادة الد ارسية** | ***دراسة الفيروسات ,اشكالها وتركيبها وطرق تضاعفها.**<br>***د ارسة تصنيف الفيروسات**<br>***د ارسة الفيروسات التي تصيب الجلد**<br>***د ارسة الفيروسات التي تصيب الجهاز التنفسي *اللقاحات وانواعها وطرق تصنيعها** |

| 9. استراتيجيات التعليم والتعلم | |
|---|---|
| الاست ارتيجية | يجب ان يكون الخريج قادر على معرفة وفهم كل مما ياتي:<br>1. معرفة وفهم الفيروسات وتركيبها وخصائصها وطرق تضاعفها. 2.فهم الفيروسات التي تصيب الجلد.<br>3.فهم ومعرفة الفيروسات التي تصيب الجهاز التنفسي. 4.دراسة اللقاحات وانواعها وطرق تصنيعها والغرض منها |

**10. بنية المقرر**

| الأسبوع | الساعات | مخرجات التعلم المطلوبة | اسم الوحدة او الموضوع | طريقة التعلم | طريقة التقييم |
|---|---|---|---|---|---|
| الاول | 2 ن + 2 ع | الفيروسات ,تركيبها وانواعها | Viruses, structure and types | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الثاني | 2 ن + 2 ع | تصنيف الفيروسات | Viruses classification | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الثالث | 2 ن + 2 ع | تضاعف الفيروسات | Replication of viruses | البوربوينت + توفر المواد والكتات | امتحانات يومية |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | الخاصه بذلك |
| الرابع | 2 ن + 2 ع | الفيروسات التي تصيب الجلد | Skin viral infections | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الخام س | 2 ن + 2 ع | الفيروسات التي تصيب الجلد | Skin viral infections | سبوتات | امتحانات يومية |
| الساد س | 2 ن + 2 ع | الفيروسات التي تصيب الجهاز التنفسي | Respiratory tract infection | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| السابع | 2 ن + 2 ع | امتحان | Exam. | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الثامن | 2 ن + 2 ع | الفيروسات التي تصيب الجهاز التنفسي | Respiratory tract infection | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| التاسع | 2 ن + 2 ع | الفيروسات التي تصيب الجهاز المعوي | GIT Viral Infections | البوربوينت + توفر المواد والكتات | امتحانات يومية |

| | | | | | |
|---|---|---|---|---|---|
| | | | | الخاصه بذلك | |
| العاشر | 2 ن + 2 ع | الفيروسات التي تنتقل جنسيا | Sexual transmit viruses | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الحادي عشر | 2 ن + 2 ع | اللقاحات ,انواعها وتركيبها | Vaccine | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الاثني عشر | 2 ن + 2 ع | طرق تصنيع اللقاحات والغرض منها | Methods of vaccine production | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الثالث عشر | 2 ن + 2 ع | امتحان الفصل الثاني | Exam. | | |

**11. تقييم المقرر**

| | | | |
|---|---|---|---|
| | الجزء النظري | الامتحان النهائي / 34 درجة | درجة السعي / 14 درجة امتحان فصل اول 14 درجة امتحان فصلي ثاني 6 درجات امتحانات يومية |
| | الجزء العملي | الامتحان النهائي / 16 درجة | درجة السعي / 6 درجة امتحان فصل اول 6 درجة امتحان فصلي ثاني 4 درجات امتحانات يومية |

| 12. مصادر التعلم والتدريس | |
|---|---|
| الكتب المقررة المطلوبة ( المنهجية أن وجدت ) | |

| المراجع الرئيسة ( المصادر) | |
|---|---|
| الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير.. ) | |
| المراجع الإلكترونية ، مواقع الانترنيت | |

| 1. اسم المقرر |
|---|
| مناعه |
| 2. رمز المقرر |
| |
| 3. الفصل / السنة |
| نظام فصلي / 2023 -2024 |
| 4. تاريخ إعداد هذا الوصف |
| 22 / 4/ 2024 |
| 5. أشكال الحضور المتاحة |
| الزامي |
| 6. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي) |

| | |
|---|---|
| 4 اسبوعيا ( ساعتان الجزء النظري + ساعتان الجزء العملي ) / عدد الوحدات = 3 | |
| 7. اسم مسؤول المقرر الدراسي ( اذا اكثر من اسم يذكر) | |
| الاسم: د.م زينب عبد محمد الايميل zainababed@uodiyala.edu.iq : | |
| 8. اهداف المقرر | |
| اهداف المادة الدراسية | 1 إعداد الطلاب للحصول على المعرفة والفهم للإطار الفكري وأسس وتطبيقات التكنولوجيا الحيوية والنانو.<br>أ-2 إعداد الطلاب لاكتساب المعرفة والفهم في علم الأحياء الدقيقة الصناعية والبيئية والغذائية أ-3 إعداد الطلاب لاكتساب المعرفة والفهم في علم الوراثة والهندسة الوراثية وعلم الوراثة الخلوية والبيولوجيا الجزيئية.<br>أ-4 إعداد الطلاب لاكتساب المعرفة والفهم لعلوم الخلية وعلم النبات والأنسجة النباتية والحيوانية وتطبيقاتها<br>أ-5 إعداد الطلاب لاكتساب المعرفة والفهم لعلم الأمراض والمناعة والبكتيريا المسببة للأمراض.<br>أ-6 إعداد الطلاب لاكتساب المعرفة والفهم لإحصاءات الحياة واللغة الإنجليزية. |
| 9. استراتيجيات التعليم والتعلم | |
| الاستراتيجية | زويد الطلاب بالأساسيات والمواضيع المتعلقة بالمعرفة والنظم الموضحة في:<br>1- توضيح وشرح المواد الدراسية من قبل أعضاء هيئة التدريس من خلال استخدام السبورة البيضاء<br>برنامج PowerPoint باستخدام شاشات LCD وإظهار البيانات والتعليم الإلكتروني ونشر المحاضرات المرئية على قناة اليوتيوب .<br>-2 تزويد الطلاب بالمعرفة من خلال الواجبات المنزلية للمفردات الأكاديمية |

| | |
|---|---|
| | 3- الطلب من الطلاب زيارة المكتبة للحصول على المعرفة الأكاديمية المتعلقة بالمفردات الأكاديمية |
| | 4- تحسين مهارات الطلاب من خلال زيارة المواقع الإلكترونية للحصول على معرفة إضافية بالمواضيع منحة دراسية<br>5-العصف الذهني أثناء المحاضرة |

**10. بنية المقرر**

| الأسبوع | الساعات | مخرجات التعلم المطلوبة | اسم الوحدة او الموضوع | طريقة التعلم | طريقة التقييم |
|---|---|---|---|---|---|
| الاول | 2 ن + 2 ع | Introduction, historical review development of immunology | Historical review, development of immunology | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الثاني | 2 ن + 2 ع | Types of immunity | Natural immunity, mechanisms of natural resistance | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |

| | | | | | |
|---|---|---|---|---|---|
| الثالث | 2 ن + 2 ع | Components of the immune system | Inflammatory response, phagocytosis, acquired immunity, activity acquired immunity (Natural) and artificial | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |
| الرابع | 2 ن + 2 ع | Antigens and Immunogens | Characteristics, some other antigens (species specific, tissue specific, Forssman antigens | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |

| | | | | | |
|---|---|---|---|---|---|
| | | CELLMEDIATED IMMUNITY: | | | |
| امتحانات يومية | سبوتات | Exam. | Exam. | 2 ن + 2 ع | الخامس |
| امتحانات يومية | البوربوينت + توفر المواد والكتات الخاصه بذلك | General characteristics and properties Monoclonal antibodies important functions of. immunoglobulins | Antibodies | 2 ن + 2 ع | السادس |
| امتحانات يومية | البوربوينت + توفر المواد والكتات الخاصه بذلك | Humoral immunity: introduction the primary and the secondary response | Humoral. Immunity | 2 ن + 2 ع | السابع |

| | | | | | |
|---|---|---|---|---|---|
| الثامن | 2 ن + 2 ع | Cell-Mediated Immunity | Cell-mediated immunity: introduction tests | البوربوينت + توفر المواد والكتات الخاصه بذلك | امتحانات يومية |