

وزارة التعليم العالي والبحث العلمي  
جهاز الاشراف والتقويم العلمي  
دائرة ضمان الجودة والاعتماد الأكاديمي

## استمارة وصف البرنامج الأكاديمي للكليات والمعاهد

للعام الدراسي 2025-2026

الجامعة : العلوم العراقية

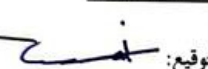
الكلية /المعهد : كلية الهندسة

القسم العلمي : هندسة الطب الحيوي

تاريخ ملء الملف : 2026-1-4

تاريخ ملء الملف : 2026-1-4

### اللجنة المركزية لضمان الجودة لمسار بولونيا

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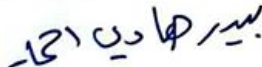
### اللجنة الفرعية لضمان الجودة لمسار بولونيا

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دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي: 

التاريخ

التوقيع



دليل البرنامج الدراسية | 2025-2026 | Modules Programs

**Al-Iraqia Science University/ Faculty of Engineering/ Biomedical Engineering**

جامعة العلوم العراقية / كلية الهندسة/ هندسة الطب الحيوي



***First Cycle – Bachelor's degree (B.Sc.) – Biomedical Engineering***

بكالوريوس هندسة -هندسة الطب الحيوي



## Table of Contents / جدول المحتويات

|                                      |                                      |
|--------------------------------------|--------------------------------------|
| 1. Mission & Vision Statement        | بيان المهمة والرؤية                  |
| 2. Program Specification             | مواصفات البرنامج                     |
| 3. Program (Objectives) Goals        | أهداف البرنامج                       |
| 4. Program Student learning outcomes | مخرجات تعلم الطالب                   |
| 5. Academic Staff                    | الهيئة التدريسية                     |
| 6. Credits, Grading and GPA          | الاعتمادات والدرجات والمعدل التراكمي |
| 7. Modules                           | المواد الدراسية                      |
| 8. Contact                           | اتصال                                |

### 1. Mission & Vision Statement

#### *Vision Statement Vision Statement*

The academic staff at the biomedical engineering department at the Iraqi Sciences University believe that students come to understand the discipline of Biomedical engineering through a combination of coursework, laboratory experiences, tutorials, research, and hospital field training. The department seeks to present academically, scientifically, and even practically in the local and international arena. The scientific laboratories of our departments are equipped with the latest devices and experiments in the field of medical equipment, biomechanics, biology and biochemistry in addition to electronics. Applying advanced studying and learning methods and keeping updated with the latest developments in this field, are one of our important aims, especially e-learning. Moreover, studying recent experiences in learning and working on applying them in line with the changing standards of scientific and practical requirements. Planning to build postgraduate studies with high standard quality by preparing material requirements from laboratories and others and the scientific needs of researchers, in addition to world-class researchers in the field of biomedical engineering, who own a distinguished research line and global scientific publication.

#### *Mission Statement*

Our mission is to provide a rigorous and comprehensive education in Biomedical Engineering that prepares students to excel as skilled professionals and innovators in the field. We are committed to cultivating a learning environment that fosters creativity, critical thinking and teamwork collaboration, while instilling a strong foundation in engineering principles and practices. Through hands-on

experiences, Ministry of Health partnerships, and exposure to emerging technologies, we aim to equip students with the technical expertise, problem-solving abilities, and adaptability needed to tackle the challenges that they will face in hospitals and clinics. Our program is dedicated to promoting ethical and sustainable practices, empowering graduates to drive efficiency and experience, in biomedical engineering. By fostering a culture of continuous learning and a deep understanding of the intersection between engineering and medicine, we strive to produce professionals who contribute to the advancement and transformation of the services delivered to the patients, by using technology to help people live longer, healthier and happier lives, which may result in improving patient's life and raise patient satisfaction, making a positive impact on society and daily life of people.

## 2. Program Specification

|                 |                        |                       |           |
|-----------------|------------------------|-----------------------|-----------|
| Programme code: | BSc-BME                | ECTS                  | 300       |
| Duration:       | 5 levels, 10 Semesters | Method of Attendance: | Full Time |

The biomedical engineering program is a multidisciplinary field that combines mechanical and electronic engineering principles alongside the medical field and applies it to the human body and also medical equipment.

This course will suit you if you're interested in learning about a range of disciplines – from mechanics and biology to physiology, programming and computer-aided design. This course will be rooted in practical activities across these subjects, learning in our state-of-the-art facilities and interdisciplinary community.

Level 1 provides students with a solid foundation in core areas, blending technical knowledge, problem-solving abilities, communication skills, and an understanding of ethical and social considerations. These courses lay the groundwork for further studies in biomedical engineering and prepare students for the challenges and opportunities in the field according to the college and department mission statements.

Levels 2, 3, 4 and 5 of the biomedical engineering program progressively equip students with the specialized knowledge and practical skills needed to excel in the field of biomedical engineering. Through a combination of theoretical coursework, hands-on projects, self-study tasks, group-based projects and practical experiences, students develop the expertise required to innovate, optimize, and lead in the biomedical engineering and private sector.

The research ethos is developed and fostered from the start via practicals, which are either embedded in lecture modules or taught in dedicated practical modules, research seminars and tutorials. There is a compulsory field course at each Level, which students must pass in order to progress into other courses in the next Levels. At Level 5 all students carry out an independent research project, in 2 semesters, which has a combined weight of 8 ECTS.

Academic tutorials are held at all levels, providing continuity and progressive guidance, e.g. assessed exercises, essays and talks, seminars projects and as opportunities to practice these skills in a subject-specific context.

### 3. Program Objectives

1. To graduate an engineer who is distinguished by his scientific and practical knowledge of engineering applications in all health and medical fields, and to have distinguished knowledge that gives him the ability to design, develop, maintain and operate modern medical devices, in a way that contributes to the scientific and medical movement and contributes to conducting research related to the medical and life aspects.
2. To graduate as an engineer capable of applying advanced diagnostic and therapeutic concepts associated with modern engineering technologies in the medical field.
3. To prepare students with a good medical background that enables him/her to communicate with all parties of the medical community to cover the requirements of the Iraqi Ministry of Health for this specialization.
4. To work to intensify the use of computers in all medical fields by updating and developing existing software, and creating new computer systems that are mainly directed to assisting the doctor in performing his diagnostic and therapeutic mission with advanced methods.
5. To prepare a scientific, engineering personality who can communicate with the requirements of the labor market from the private or governmental sector in the medical engineering field, self-developing and normalizing, according to supply and demand.

### 4. Student Learning Outcomes

Biomedical Engineering is the application of engineering principles and techniques to the medical field. It combines the design and problem-solving skills of engineering with medicine and biological science to help improve patient health care and the quality of life of healthy individuals. The Department offers a Bachelor of Science in Biomedical Engineering with a concentration in the topics of mechanics, electronics, computing and medical-related topics. The Biomedical engineering curriculum and experiences are designed to prepare students, in part, for entry into professional health programs, graduate studies, technical careers and education.

#### Outcome 1

*Technical knowledge*

Graduates will possess a solid understanding of the principles, theories, and concepts related to biomedical engineering. They will have knowledge of electrical circuits and electronics, biomechanics, control systems, CAD, medical imaging, biomaterials and other relevant areas.

## **Outcome 2**

### *Teamwork and Communication*

Graduates will be able to effectively collaborate with multidisciplinary teams, in the hospitals and also the private medical sector and communicate technical information clearly and concisely. They will develop skills in teamwork, leadership, and interpersonal communication.

## **Outcome 3**

### *Laboratory and Field Studies*

Graduates will be able to perform laboratory experiments and project-based tasks in their studies, by using scientific equipment and computer technology while observing and learning through hands-on tasks.

## **Outcome 4**

### *Data collection and analysis*

Graduates will be able to demonstrate scientific quantitative skills, such as the ability to design scientific experiments, perform data collection, analyze the collected data and draw conclusions from the analysis.

## **Outcome 5**

### *Problem-solving and Critical Thinking*

Graduates will be able to develop problem-solving skills and critical thinking and apply it to biomedical engineering. They will learn to identify and analyze issues, related to their field and propose effective solutions, and make informed decisions in complex technical situations.

## **Outcome 6**

### *Professionalism and work ethics*

Students will understand the ethical and professional responsibilities associated with biomedical engineering. While their work is mostly in contact with patients, being in the hospitals or in the private sector, they will demonstrate professionalism, integrity, and an understanding of the impact of their work on society and the patient's well-being. They will be also prepared to adapt to advancements in technology, stay updated with industry trends, and engage in self-directed learning to help to tackle challenges in the field.

## **5. Academic Staff**

1. Assistant Professor Dr. Naseer AbdulRazak Al-Homood / Specialization: Civil Engineering – Surveying / Urban Planning/ Bachelor's Degree: Civil Engineering (Surveying)/ Master's Degree: Urban Planning/ PhD: Urban Planning / Email: [naseerhasach@baghdadcollege.edu.iq](mailto:naseerhasach@baghdadcollege.edu.iq)/ Mobile:009647844434485
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### Credits, Grading and GPA

#### Credits

Iraqi Sciences University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

#### Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

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

|                                                                                                                                                                                                                                                                                                                                                                                 |                  |                     |         |                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|---------|---------------------------------------|
| (50 - 100)                                                                                                                                                                                                                                                                                                                                                                      | 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:                                                                                                                                                                                                                                                                                                                                                                           |                  |                     |         |                                       |
| <p>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.</p> |                  |                     |         |                                       |

### Calculation of the Cumulative Grade Point Average (CGPA)

- The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a 4-year B.Sc. degree:

$$CGPA = [ (1^{st} \text{ module score} \times ECTS) + (2^{nd} \text{ module score} \times ECTS) + ..... ] / 240$$

## 1. Curriculum/Modules

### Level 1

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

| Code   | Module                | SSWL | USSWL | ECTS | Type | Pre-request |
|--------|-----------------------|------|-------|------|------|-------------|
| BME111 | Statics               | 63   | 87    | 6.00 | C    |             |
| BME112 | Biology               | 93   | 57    | 6.00 | S    |             |
| BME113 | Calculus I 1          | 63   | 87    | 6.00 | C    |             |
| BME114 | English Language 1    | 33   | 17    | 2.00 | S    |             |
| BME115 | Freedom and Democracy | 33   | 17    | 2.00 | B    |             |

|               |                            |    |     |      |   |  |
|---------------|----------------------------|----|-----|------|---|--|
| <b>BME116</b> | <b>Physics</b>             | 48 | 102 | 6.00 | S |  |
| <b>BME117</b> | <b>Presentation skills</b> | 18 | 32  | 2.00 | S |  |

**Semester 2 | 30 ECTS | 1 ECTS = 25 hrs**

| Code          | Module                                        | SSWL | USSWL | ECTS | Type | Pre-request |
|---------------|-----------------------------------------------|------|-------|------|------|-------------|
| <b>BME121</b> | <b>Electric Circuit 1</b>                     | 78   | 72    | 6.00 | C    |             |
| <b>BME122</b> | <b>Calculus I 2</b>                           | 63   | 87    | 6.00 | C    | BME113      |
| <b>BME123</b> | <b>Anatomy I</b>                              | 63   | 37    | 4.00 | C    |             |
| <b>BME124</b> | <b>Dynamics</b>                               | 48   | 27    | 3.00 | S    |             |
| <b>BME125</b> | <b>Computer Skills 1</b>                      | 63   | 62    | 5.00 | B    |             |
| <b>BME126</b> | <b>Introduction to Biomedical Engineering</b> | 78   | 72    | 6.00 | C    |             |

**Level 2**

**Semester 1 | 30 ECTS | 1 ECTS = 25 hrs**

| Code          | Module                    | SSWL | USSWL | ECTS | Type | Pre-request |
|---------------|---------------------------|------|-------|------|------|-------------|
| <b>BME211</b> | <b>Mathmatics II 1</b>    | 63   | 87    | 6.00 | S    | BME122      |
|               | <b>Arabic 2</b>           | 33   | 17    | 2.00 | S    | UOB101      |
| <b>BME212</b> | <b>Chemistry</b>          | 63   | 37    | 4.00 | B    |             |
| <b>BME213</b> | <b>Electric Circuit 2</b> | 78   | 72    | 6.00 | B    | BME121      |

|               |                                 |    |    |      |   |         |
|---------------|---------------------------------|----|----|------|---|---------|
| <b>BME214</b> | <b>Biomaterials Science</b>     | 63 | 62 | 5.00 | C |         |
| <b>BME215</b> | <b>Mechanics of Materials</b>   | 48 | 77 | 5.00 | B | BME 111 |
|               | <b>Crimes of Baath's Regime</b> | 33 | 17 | 2.00 | S |         |

**Semester 2 | 30 ECTS | 1 ECTS = 25 hrs**

| Code          | Module                      | SSWL | USSWL | ECTS | Type | Pre-request      |
|---------------|-----------------------------|------|-------|------|------|------------------|
| <b>BME221</b> | <b>Mathmatics II 2</b>      | 63   | 62    | 5.00 | S    | BME211           |
| <b>BME222</b> | <b>Biochemistry</b>         | 63   | 62    | 5.00 | B    | BME212           |
| <b>BME223</b> | <b>Digital Logic Design</b> | 63   | 87    | 6.00 | B    |                  |
| <b>BME224</b> | <b>Biomechanics</b>         | 63   | 62    | 5.00 | C    | BME 111; BME 215 |
|               | <b>Computer 2</b>           | 48   | 27    | 3.00 | S    | UOB103           |
| <b>BME225</b> | <b>Anatomy II</b>           | 63   | 37    | 4.00 | B    | BME123           |
|               | <b>English Language 2</b>   | 33   | 17    | 2.00 | S    | UOB102           |

## 2. Contact

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جامعة العلوم  
الرياضية

دليل المواد الدراسية | 2025-2026 | Modules Catalogue

**AL-Iraqia Sciences University/ Faculty of Engineering/  
Biomedical Engineering**

جامعة العلوم العراقية / كلية الهندسة / هندسة الطب الحيوي



***First Cycle – Bachelor's degree (B.Sc.) –  
Biomedical Engineering***

بكالوريوس هندسة - هندسة الطب الحيوي



## Table of Contents

1. Overview
2. Undergraduate Modules 2024-2025
3. Contact

### 1. Overview

This catalogue is about the courses (modules) given by the program of Biomedical Engineering to gain the Bachelor of Science degree. The program delivers (59) Modules with (7500) total student workload hours and 300 total ECTS. The module delivery is based on the Bologna Process.

#### نظرة عامة

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج الهندسة الطب الحيوي للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (59) مادة دراسية مع (7500) إجمالي ساعات حمل الطالب و300 إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

### 2. Undergraduate Courses 2024-2025

#### Level/ UGI

#### Module 1

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Course/Module Title   | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME111                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Statics               | 6             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1                     | 63            | 87          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                       |               |             |
| <p>The Statics module is a fundamental course in engineering that focuses on the study of forces and their effects on rigid bodies in a state of static equilibrium. It covers the principles of statics, which involve the analysis of forces acting on objects at rest or in a state of constant motion. Students learn about vector quantities, such as forces and moments, and their application in solving engineering problems. The module introduces concepts like free-body diagrams, equilibrium equations, trusses, frames, and friction. In addition, students will also study moment of inertia and also work and energy. Through theoretical explanations and problem-solving exercises, students gain an understanding of how to analyze and predict the behavior of structures and objects under various loading conditions. The Statics module forms the basis for further studies in mechanics of materials, and other branches of engineering, providing students with essential skills to analyze engineering structures and systems.</p> |                       |               |             |

**Module 2**

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME112                                                                                                                                                                                                                                                                                                                                                                                                                                               | Biology               | 6             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                         | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2                     | 93            | 57          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |               |             |
| <p>The goal of Biology is to explain the physical and chemical factors that are responsible for the origin, development and progression of life. Biology course present tremendous challenges to both students&amp; teachers for acquisition of the basic facts is essential to the study of Biology, but also important for students to develop the ability to solve practical, real-life problems related to the knowledge they have acquired.</p> |                       |               |             |

**Module 3**

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Course/Module Title   | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Calculus l1           | 6             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                       | 63            | 87          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                       |               |             |
| <p>The Calculus l 1 module is a foundational course that focuses on developing mathematical skills and concepts essential for engineering applications. The module covers a wide range of mathematical topics relevant to engineering, including calculus, algebra, trigonometry, and complex numbers. Students learn how to solve mathematical problems using techniques such as differentiation, integration, solving equations, vectors, and matrices. The module emphasizes the practical application of mathematics in engineering, introducing concepts such as rates of change, optimization, and engineering modeling. The Calculus l 1 module aims to provide students with a strong mathematical foundation necessary for further studies in engineering disciplines. It enables students to apply mathematical principles and techniques to solve engineering problems, analyze data, and make informed decisions in their future engineering endeavors.</p> |                       |               |             |

**Module 4**

| Code         | Course/Module Title   | ECTS          | Semester    |
|--------------|-----------------------|---------------|-------------|
| UOB102       | English Language 1    | 2             | 1           |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
|              |                       |               |             |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |    |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|----|
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | 33 | 17 |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |    |    |
| <p>The English Language 1 module is a foundational course that focuses on developing students' proficiency in the English language. It covers various aspects of the language, including reading, writing, listening, and speaking. The module aims to improve students' vocabulary, grammar, comprehension, and communication skills in English. Students learn to analyze and interpret different types of texts, write coherent and well-structured essays, engage in conversations, and deliver presentations in English. The module also emphasizes the development of critical thinking, cultural awareness, and effective communication strategies. Through interactive activities, discussions, and assignments, students gain confidence in their ability to use English accurately and fluently. The English Language 1 module provides a strong language foundation for students to effectively communicate in academic, professional, and everyday contexts, preparing them for further studies and enhancing their global communication abilities.</p> |  |    |    |

**Module 5**

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Course/Module Title        | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------|-------------|
| UOB104                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Human Rights and Democracy | 2             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Lect/Lab./Prac./Tutor      | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                            | 33            | 17          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                            |               |             |
| <p>The Freedom and Democracy module is a comprehensive course that focuses on the principles, theories, and practices related to human rights and freedoms. It provides an in-depth exploration of the fundamental rights and freedoms that all individuals are entitled to, regardless of their background, identity, or circumstances. The module covers various topics, including civil and political rights, economic and social rights, gender equality, racial and ethnic discrimination, freedom of expression, and the right to privacy. Students examine international human rights instruments and conventions, as well as the mechanisms for their enforcement and protection. They also analyze case studies and real-world examples to gain a deeper understanding of contemporary human rights issues and challenges. The module aims to foster critical thinking, empathy, and a commitment to upholding human rights, preparing students to be informed global citizens who actively contribute to promoting and protecting human dignity and equality for all.</p> |                            |               |             |

**Module 6**

| Code         | Course/Module Title   | ECTS          | Semester    |
|--------------|-----------------------|---------------|-------------|
| BME116       | Physics               | 6             | 1           |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 3            |                       | 48            | 102         |

| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Physics module is a fundamental component of the field of physics that encompasses the study of matter, energy, and their interactions. It provides a broad overview of the basic principles and laws governing the physical world. This module typically covers topics such as mechanics, thermodynamics, electromagnetism, optics, and modern physics. Students delve into concepts like motion, forces, energy, heat, electricity, magnetism, light, and quantum mechanics. The physics module aims to develop a conceptual understanding of the natural phenomena that surround us and to provide a foundation for more advanced topics in specialized branches of physics. Through theoretical explanations, mathematical equations, and experimental demonstrations, students gain insight into the laws that govern the physical universe and learn to apply them in practical situations. |

**Module 7**

| Code                                                                                                                                                                                                                                                                                                                                                                                                                    | Course/Module Title   | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME117                                                                                                                                                                                                                                                                                                                                                                                                                  | Presentation skills   | 2             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                            | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                       |                       | 18            | 32          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                             |                       |               |             |
| <p>To understand the basic concept of presentation skills.</p> <p>To be able to deliver research and academic presentation.</p> <p>To develop his/her communication skills and languages in affective matter.</p> <p>To have the ability of asking and answering research questions in a proper method.</p> <p>To understand how to evaluate in effective way a research or any other related subject presentation.</p> |                       |               |             |

**Module 8**

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME121                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Electric Circuits 1   | 6             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2                     | 78            | 72          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                       |               |             |
| <p>The Electrical Circuits 1 module is a core course in electrical engineering that focuses on the principles and analysis of electrical circuits. It covers the fundamental concepts and laws governing the behavior of electric currents and voltages in various circuit configurations. Students learn about basic circuit elements such as resistors, capacitors, and inductors, as well as their properties and behaviors. The module explores topics including Ohm's law, Kirchhoff's laws, circuit analysis techniques, network theorems, and transient and steady-state responses.</p> |                       |               |             |

Students also gain hands-on experience with circuit simulation software and laboratory experiments to validate theoretical concepts. The Electrical Circuits 1 module aims to provide students with a solid understanding of electrical circuits and their applications. It forms the foundation for advanced courses in electronics, power systems, and control systems, enabling students to design, analyze, and troubleshoot electrical circuits in various engineering disciplines.

### Module 9

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME122                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Calculus I 2          | 6             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       | 63            | 87          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                       |               |             |
| <p>The Calculus I 2 module is a continuation of the foundational course in engineering mathematics, further expanding on the mathematical concepts and techniques relevant to engineering applications. Building upon the knowledge gained in Calculus I 1, this module delves deeper into advanced topics. It covers areas such as differential equations, linear algebra, complex analysis, probability theory, and numerical methods. Students learn to apply these mathematical tools to model and solve engineering problems, analyze systems, and make informed decisions. The module emphasizes the development of analytical and problem-solving skills, as well as the ability to use tools to solve problems. The Calculus I 2 module equips students with a broader mathematical toolkit, enabling them to tackle more complex engineering challenges and advance their understanding of mathematical concepts applicable to various engineering disciplines.</p> |                       |               |             |

### Module 10

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Course/Module Title   | ECTS          | Semester    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME123                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Anatomy I             | 4             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                       | 63            | 37          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                       |               |             |
| <p>The course provides a rigorous overview of upper limbs and lower limbs anatomy, muscles of the pectoral and back of the body, gluteal region and chest cavity thoracic wall physiology and pathophysiology. The course includes case studies and a design term project. Also learning the anatomy and function of the human body, focusing on the contributions of the musculoskeletal systems to health and wellbeing across the lifespan. Interrelationships between these and other organ systems for maintaining homeostasis and performing activities of living will be emphasized, along with the relevance of concepts to aspects of health care. You will have opportunities to apply your knowledge as you analyses health care scenarios and will expand</p> |                       |               |             |

your vocabulary (as is used within health care settings) for effectively communicating biological information. The foundation knowledge and critical thinking skills that you develop in this unit will support your clinical reasoning and ongoing learning in other units within your course and your practice as a health professional.

### Module 11

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME124                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Dynamics              | 3             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                       | 48            | 27          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |               |             |
| <p>The Dynamics module is a core course in engineering that focuses on the study of the motion of objects and the forces acting upon them. It extends the principles learned in the Statics module to objects in motion. The module covers topics such as kinematics, kinetics, Newton's laws of motion, energy and momentum principles, and the analysis of systems of particles and rigid bodies. Students learn to apply mathematical techniques to analyze the forces and motions of objects in various scenarios, such as particles in linear or curvilinear motion, rotational motion, and systems undergoing acceleration. The module emphasizes problem-solving skills, critical thinking, and an understanding of the principles that govern the dynamics of mechanical systems. The Dynamics module provides students with the tools to analyze and predict the behavior of objects and systems in motion, enabling them to design and optimize engineering solutions in Biomechanics.</p> |                       |               |             |

### Module 12

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| UOB103                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Computer              | 3             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2                     | 48            | 27          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |               |             |
| <p>The Programming skills I module is an introductory course that focuses on teaching students the fundamental concepts and principles of computer programming. The module aims to develop students' problem-solving skills and their ability to write computer programs using a programming language. Students typically learn programming concepts such as variables, data types, control structures (conditionals and loops), functions, and basic algorithms. They are introduced to a programming language C++, and learn how to write code to solve simple problems and automate tasks. The module emphasizes the importance of logical thinking, algorithm design, debugging, and code documentation. Students also gain exposure to software development practices, such as version control and testing. The Programming skills I module</p> |                       |               |             |

provides a solid foundation for further studies in computer science and programming, enabling students to think computationally and start building their programming skills.

### Module 13

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Course/Module Title                    | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---------------|-------------|
| BME126                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Introduction to Biomedical Engineering | 6             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lect/Lab./Prac./Tutor                  | SSWL (hr/sem) | USWL (hr/w) |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                                      | 78            | 72          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                        |               |             |
| <p>The Introduction to Biomedical Engineering module is a core course in biomedical engineering that focuses on the principles and displumes of biomedical engineering. It covers the fundamental branches of biomedical engineering including, introduction to the duties of biomedical engineering Biomechanics and rehabilitation engineering, Biomedical transducers and sensors, and different technologies that are used to view the human body and medical imaging modalities and their applications. Students learn about basic types of Bioelectrical signals, biomechanical signals, biochemical signals, bioimpedance signals and also examples of imaging modalities such as ultrasound, magnetic resonance imaging (MRI), computed tomography (CT), positron emission tomography (PET), X-ray, properties of X-ray radiation, biological effects of using X-ray on biological cells, X-ray unit's rooms in the hospital, main part of an X-ray machine. Students also gain hands-on experience with biomedical devices and equipment and laboratory experiments to validate theoretical concepts. The Introduction to Biomedical Engineering module aims to provide students with a solid understanding of the branches of biomedical engineering and their applications. It forms the foundation for advanced courses in biosensor, imaging devise, biomechanics, and biomedical instrumentation and biomedical signal analysis, enabling students to analyze, and troubleshoot in various biomedical engineering disciplines.</p> |                                        |               |             |

### Module 14

| Code                                                                                                                                                                                                                                                                                                                                                           | Course/Module Title   | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| UOB101                                                                                                                                                                                                                                                                                                                                                         | Arabic                | 2             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                   | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                              |                       | 33            | 17          |
| Description                                                                                                                                                                                                                                                                                                                                                    |                       |               |             |
| <p>تدريس اللغة العربية يهدف إلى تحقيق الأهداف التالية:</p> <ol style="list-style-type: none"> <li>1- تعليم اللغة العربية بقواعدها الصحيحة كما وردت في القرآن الكريم.</li> <li>2- تطوير مهارات الاستماع والتحدث والقراءة والكتابة باللغة العربية الفصحى.</li> <li>3- تنمية الملكة اللغوية وقدرات التفكير والتحليل عن طريق دراسة الأدب والشعر والنثر.</li> </ol> |                       |               |             |

- 4- تجاوز الكثير من الأخطاء الشائعة في لغتنا العربية وفي لغة البحث الأكاديمي ولغة الحوار والتخاطب.
- 5- معرفة الفروق اللغوية بين الكلمات المتشابهة واختلاف معانيها في القرآن الكريم.

## Level/ UGII

### Module 1

| Code                                                                                                                                                                                                                                                                                                                                                                                                                       | Course/Module Title   | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME211                                                                                                                                                                                                                                                                                                                                                                                                                     | Mathematics II 1      | 6             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                               | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                          |                       | 63            | 87          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                |                       |               |             |
| The main goal of this module is to introduce a number of many concepts motivated through mathematical applications. These applications build from the basic mathematical content to create a path into whole fields that are rooted in calculus. Also added material on applications of differentials and partial derivatives as a definitive application for both of these topics in thermodynamics, physically, ... etc. |                       |               |             |

### Module 2

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Course/Module Title   | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME212                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Chemistry             | 4             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2                     | 63            | 37          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       |               |             |
| The goal of chemistry is to explain the chemical factors that are responsible for the origin, development and progression of life. chemistry course present tremendous challenges to both students& teachers for acquisition of the basic facts is essential to the study of chemistry, developing the ability to solve practical, real-life problems related to the knowledge they have acquired. essential to the understanding of matter, atomic structure and the bonding of elements to form compounds. mole concept, chemical reactions, chemical nomenclature and solvents. chemical reactions including oxidation and reduction, acids and bases, energy changes in reactions, reaction rates and chemical equilibrium. Furthermore, key subject matter requisite for developing a broad knowledge in Chemistry. |                       |               |             |

**Module 3**

| Code                                                                                                                                                                                                                      | Course/Module Title   | ECTS          | Semester    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME213                                                                                                                                                                                                                    | Electric Circuit 2    | 6             | 1           |
| Class (hr/w)                                                                                                                                                                                                              | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 3                                                                                                                                                                                                                         | 2                     | 78            | 72          |
| Description                                                                                                                                                                                                               |                       |               |             |
| To learn how to analyze electrical circuits and calculate different responses for different components in the circuit. Explain the working principle, construction, applications of AC machines and measuring instruments |                       |               |             |

**Module 4**

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME214                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Biomaterials Science  | 5             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       | 63            | 62          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       |               |             |
| The purpose of this course is to present an overview of fundamental biomaterials. Topics include; Definition of biomaterials, Characterization of materials, Metallic implant, Ceramics implants, Polymers implants, Tissue response, and Biocompatibility. Physical properties of natural and synthetic (e.g. stainless steel, polymers) materials used in biological engineering applications are presented in this course. Topics will include microstructure and mechanical properties of typical biomaterials, quantification of advanced material properties and behaviors, fabrication, compatibility, biodegradation and mechanical failure. Typical applications will include processing of biomaterials as well as equipment and implant design. |                       |               |             |

**Module 5**

| Code         | Course/Module Title    | ECTS          | Semester    |
|--------------|------------------------|---------------|-------------|
| BME215       | Mechanics of Materials | 5             | 1           |
| Class (hr/w) | Lect/Lab./Prac./Tutor  | SSWL (hr/sem) | USWL (hr/w) |
|              |                        |               |             |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |    |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|----|
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | 48 | 77 |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |    |    |
| <p>The aim of this course is to learn students to be able to solve the solid mechanics problems for biomedical applications. The course covers exercises corresponding the following topics:</p> <ol style="list-style-type: none"> <li>1.Introduction of the stresses and strains.</li> <li>2.Know the theory and background of fundamental concepts as stresses and strains, deformations and displacements, elasticity and inelasticity, strain energy, and load-carrying capacity.</li> <li>3.Concepts underlie the design and analysis of a huge variety of mechanical and structural systems.</li> </ol> |  |    |    |

**Module 6**

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Course/Module Title   | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| UOB20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Arabic 2              | 2             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       | 33            | 17          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                       |               |             |
| <p>تدريس اللغة العربية يهدف إلى تحقيق الأهداف التالية:</p> <ol style="list-style-type: none"> <li>1- تعليم اللغة العربية بقواعدها الصحيحة كما وردت في القرآن الكريم.</li> <li>2- تطوير مهارات الاستماع والتحدث والقراءة والكتابة باللغة العربية الفصحى.</li> <li>3- تنمية الملكة اللغوية وقدرات التفكير والتحليل عن طريق دراسة الأدب والشعر والنثر.</li> <li>4- تجاوز الكثير من الأخطاء الشائعة في لغتنا العربية وفي لغة البحث الأكاديمي ولغة الحوار والتخاطب.</li> <li>5- معرفة الفروق اللغوية بين الكلمات المتشابهة واختلاف معانيها في القرآن الكريم.</li> <li>6- بيان الظواهر اللغوية التي تميزت بها لغتنا العربية عن باقي اللغات الأخرى مثل الترادف والتضاد والاشتراك اللفظي والتعريب وغيرها.</li> </ol> |                       |               |             |

**Module 7**

| Code                                                                                                                                                                                             | Course/Module Title              | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------|-------------|
| UOB20                                                                                                                                                                                            | Crimes of Baath's Regime In Iraq | 2             | 1           |
| Class (hr/w)                                                                                                                                                                                     | Lect/Lab./Prac./Tutor            | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                |                                  | 33            | 17          |
| <b>Description</b>                                                                                                                                                                               |                                  |               |             |
| <p>The Crimes of Baath's Regime module is a comprehensive course that focuses on the crimes of the previous regime of the Baath. It will illustrate the crimes committed by the Baath regime</p> |                                  |               |             |

against the Iraqi citizens and also other crimes to the neighboring countries. It also discusses the crimes of mass genocides committed by the Baath regime against the Iraqi people in the north and the south of Iraq.

### Module 8

| Code                                                                                                                                                                                                                                                                                                                                                                                                                              | Course/Module Title   | ECTS          | Semester    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME221                                                                                                                                                                                                                                                                                                                                                                                                                            | Mathematics II 2      | 5             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                      | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       | 63            | 62          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                       |                       |               |             |
| Our Main Goal in this module is to introduce a number of new concepts motivated through mathematical applications. These applications build from the basic mathematical content to create a path into whole fields that are rooted in calculus. We have also added material on applications of differentials and partial derivatives as a definitive application for both of these topics in thermodynamics, physically, ... etc. |                       |               |             |

### Module 9

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Course/Module Title   | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME222                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Biochemistry          | 5             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2                     | 63            | 62          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |               |             |
| To provide a foundation in chemical science which gives the underpinning knowledge needed to progress to the first year of an undergraduate programmer in a biochemical or medically related science. By offering a basic understanding of the various processes involved in the living systems of human being. To provide a practical based course that will enable full participate in laboratory work in the first year at undergraduate level. This module aims to teach you core concepts in biochemistry including topics on structure of proteins, enzyme kinetics and metabolic pathways. The module will also provide a background to fundamental aspects of chemistry. This module provides you with the core knowledge and skills to enhance performance in the area of biological chemistry and is a pre-requisite for second year modules in Metabolism, Analytical Techniques in Biochemistry, Bioinorganic Chemistry, and final year modules in Energy Metabolism and in Pharmacology and Medicinal Chemistry. Graduate |                       |               |             |

attributes: as part of this module, you will develop organized analytical skills and group / team work skills.

### Module 10

| Code                                                                                                       | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME223                                                                                                     | Digital Logic Design  | 6             | 2           |
| Class (hr/w)                                                                                               | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                          | 2                     | 63            | 87          |
| Description                                                                                                |                       |               |             |
| This course aims to introduce the fundamentals of number system, Boolean Algebra and digital logic design. |                       |               |             |

### Module 11

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME224                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Biomechanics          | 5             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       | 63            | 62          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       |               |             |
| <p>The aim of this course is to learn students to be able to solve the solid biomechanics problems for biomedical applications. The course covers exercises corresponding the following topics:</p> <ol style="list-style-type: none"> <li>1.Introduction of the biomechanics, important and applications.</li> <li>2.Know the theory and relation concepts of the plane and tri stresses and strains, deformations and displacements, elasticity and viscoelasticity, strain energy, and load-carrying capacity.</li> <li>3.Concepts underlie the analysis of a huge variety of human body systems.</li> <li>4.Perceptions underlie the analysis of cyclic loads (fatigue) and bone fractures.</li> </ol> |                       |               |             |

### Module 12

| Code         | Course/Module Title   | ECTS          | Semester    |
|--------------|-----------------------|---------------|-------------|
| UOB20        | Computer 2            | 3             | 2           |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
|              |                       |               |             |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |   |    |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----|
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2 | 48 | 27 |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |   |    |    |
| <p>This program aims to support the health sector in the country with specialized engineers who are needed to improve methods for the medical care patients and the fruitful usage of engineering in the field of medicine. The program is dedicated to preparing the graduated engineers for the professional employment in areas such as the medical device industry, engineering consulting, biomechanics, biomedical imaging and signal processing, and biotechnology by using Mat-Lab programming.</p> |   |    |    |

**Module 13**

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Course/Module Title   | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| BME225                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Anatomy II            | 4             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                       | 63            | 37          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |               |             |
| <p>Fundamentals of regional Anatomy gives students in-depth instruction in the organization, structures, and functions of the human body. Students will learn the terminology, anatomy and physiology, and pathology of each body system and how they interrelate to maintain homeostasis. It is aimed to support the health sector in the country with specialized engineers who are needed to improve methods for the Healthcare of patients and the fruitful usage of engineering in the field of medicine. The program is dedicated to preparing the graduated engineers for the professional employment in areas such as the medical device industry, engineering consulting, reading and preparing reports, biomedical imaging and signal processing, and biotechnology. The professional Biomedical Engineer requires a sound knowledge of the engineering principles and other skills of engineering science in parallel with anatomy.</p> |                       |               |             |

**Module 14**

| Code               | Course/Module Title   | ECTS          | Semester    |
|--------------------|-----------------------|---------------|-------------|
| UOB20              | English Language 2    | 2             | 2           |
| Class (hr/w)       | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                  |                       | 33            | 17          |
| <b>Description</b> |                       |               |             |

The course aims at developing English communication skills covering speaking, listening, reading and writing skills in a university environment. In particular, it emphasizes the use of these skills in meaningful communicative tasks in academic and scientific contexts. Students will learn how to write academic texts effectively, as well as to improve their grammar and vocabulary. Strategies for acquiring the language are also included. Furthermore, they will gain confidence in speaking English in an academic context and understanding what foreigners are saying more easily.

## Contact

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## MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| Module Information                 |                                               |                               |                                                                                                                                                                                                                                          |
|------------------------------------|-----------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                                               |                               |                                                                                                                                                                                                                                          |
| Module Title                       | Chemistry                                     |                               | Module Delivery                                                                                                                                                                                                                          |
| Module Type                        | B                                             |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | BME212                                        |                               |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 4                                             |                               |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 100                                           |                               |                                                                                                                                                                                                                                          |
| Module Level                       | 2                                             | Semester of Delivery          | 1                                                                                                                                                                                                                                        |
| Administering Department           | Biomedical Engineering                        | College                       | Faculty of Engineering                                                                                                                                                                                                                   |
| Module Leader                      | Assistant professor. Huda Najim Eldeen Al-Ani | e-mail                        | hudanajim@baghdadcollege.edu.iq                                                                                                                                                                                                          |
| Module Leader's Acad. Title        | Assistant professor                           | Module Leader's Qualification | MSc.                                                                                                                                                                                                                                     |
| Module Tutor                       | Assistant professor Raji Toma Naser           | e-mail                        | rajitoma@baghdadcollege.edu.iq                                                                                                                                                                                                           |
| Peer Reviewer Name                 | Assistant professor. Huda Najim Eldeen Al-Ani | e-mail                        | hudanajim@baghdadcollege.edu.iq                                                                                                                                                                                                          |
| Scientific Committee Approval Date | 9\2025                                        | Version Number                | 1.0                                                                                                                                                                                                                                      |

| Relation with other Modules       |      |          |   |
|-----------------------------------|------|----------|---|
| العلاقة مع المواد الدراسية الأخرى |      |          |   |
| Prerequisite module               | None | Semester | 2 |
| Co-requisites module              | None | Semester |   |

| Module Aims, Learning Outcomes and Indicative Contents           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | <p>The goal of chemistry is to explain the chemical factors that are responsible for the origin, development and progression of life. Present tremendous challenges to both students &amp; teachers for acquisition of the basic facts is essential to the study of chemistry, developing the ability to solve practical, real life problems related to the knowledge they have acquired. acquire scientific knowledge and understanding of scientific theories and practice • develop a range of experimental skills, including handling variables and working safely, essential to the understanding of matter, atomic structure and the bonding of elements to form compounds. mole concept, chemical reactions, chemical nomenclature and solvents. chemical reactions including oxidation and reduction, acids and bases, energy changes in reactions, reaction rates and chemical equilibrium. Furthermore, key subject matter requisite for developing a broad knowledge in Chemistry.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <p>Graduates will be able to:</p> <ol style="list-style-type: none"> <li>1. Apply their knowledge and understanding of physical and chemistry laws, energy and chemical solutions analysis in order to modul Biomedical Engineering and similar systems.</li> <li>2. Explain the role of Biomedical Engineers in society and the constraints within which their engineering judgment will be exercised.</li> <li>3. Students are able to understand principles and concepts related to the structure of matter, chemical reactions, solvents and organic chemistry;</li> <li>4. acquire basic practical skills in (a) demonstration, manipulation and use of chemicals and standard laboratory apparatus; (b) predicting the outcome of simple chemical reactions; (c) recording and analysis of experimental measurements and procedures.</li> <li>5. gain skills in scientific writing, problem solving, critical analysis and teamwork, as well as basic research skills. Use scientific data and evidence to solve problems and discuss the limitations of scientific methods, communicate effectively and clearly, using scientific terminology, notation and conventions.</li> <li>6. could be analyses the solution, understand that the application of scientific knowledge can benefit people and the environment • enjoy science and develop an informed interest in scientific matters which support further study.</li> <li>8. Subject-specific skills for Design, from requirement, market need or specification, a biomedical engineering device implant or system, up to the preliminary design stage, and present this design via a series of poster, written and oral presentations from both group and individual work;</li> <li>9. Use laboratory and workshop equipment to generate data, including both engineering and physiological measurements, with appropriate rigor</li> </ol> |
| <b>Indicative Contents</b>                                       | Chemistry gives you a fundamental understanding of the world around you.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| المحتويات الإرشادية | <p>Understanding the science behind everyday objects and processes helps you understand people better. Also, chemistry teaches you about the laws of nature. You understand things like gravity, the effects of electricity, and how forces in the world affect your day-to-day life. It gives you a basic understanding of the world around you.</p> <p>understanding of matter, atomic structure and the bonding of elements to form compounds. The mole concept, chemical reactions, chemical nomenclature and solvents. These topics lead to a description of chemical reactions including oxidation and reduction, acids and bases, energy changes in reactions, reaction rates and chemical equilibrium. Furthermore, key subject matter requisite for developing a broad knowledge in Chemistry.</p> |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>1-Explain the subject in a simple way, its Important to teach students about conducting experiments in a laboratory in a clear and easy way. And then, the students should learn the key topics.</p> <p>2-Explain chemistry concepts in a visual way. A picture is worth a thousand words, as it will help you to explain the topic clearly.</p> <p>3-Provide relevant and interesting chemistry examples to help the students to understand the concept, they need to remember the main points.</p> <p>4-The best way to learn chemistry is by practicing. They need to have a good understanding of chemistry concepts to get good scores on a chemistry test.</p> <p>5-Make chemical experiments and made the reports ,tutorial problems</p> <p>6- seminars and quiz testes</p> |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 63  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 37  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 2.4 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 100 |                                                                           |     |

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

|                      |                 | number |                  |      | Outcome     |
|----------------------|-----------------|--------|------------------|------|-------------|
| Formative assessment | Quizzes         | 5      | 5%               | 3-10 | 2,4,6 and 8 |
|                      | Assignments     | 2      | 5%               | 3-12 | 5,7,9       |
|                      | Projects / Lab. | 1      | 10%              | 2-7  | 2.4.6,7     |
|                      | Report          | 5      | 5%               | 2    | 5,7,8       |
| Summative assessment | Midterm Exam    | 4 hr.  | 25%              | 7    | 1-5\7-9     |
|                      | Final Exam      | 3 hr   | 50%              | 16   | All         |
| Total assessment     |                 |        | 100% (100 Marks) |      |             |

| Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري |                                                                                                    |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------|
|                                                         | Material Covered                                                                                   |
| Week 1                                                  | Introduction to general chemistry                                                                  |
| Week 2                                                  | Methods and measurements                                                                           |
| Week 3                                                  | Structure of atom and atomic number and mass no.                                                   |
| Week 4                                                  | The periodic table of elements                                                                     |
| Week 5                                                  | Application of analytical chemistry, The Molar Mass of a Volatile Liquid                           |
| Week 6                                                  | Acids and alkaline solutions and buffers, Determining the Mole Ratios in a Chemical Reaction       |
| Week 7                                                  | Volumetric analysis, Titration Curves of Strong and Weak Acids and Bases                           |
| Week 8                                                  | Calculation of molarity and titration, Using Conductivity to Find an Equivalence Point             |
| Week 9                                                  | Hydrolysis and calculate the pH, Titration of a Diprotic Acid: Identifying an Unknown              |
| Week 10                                                 | Mid exam                                                                                           |
| Week 11                                                 | Acid – base indicators, Investigating Indicators, The Effect of Acid Deposition on Aqueous Systems |
| Week 12                                                 | Oxidation-Reduction Titrations                                                                     |
| Week 13                                                 | buffers and testing the Effectiveness of a Buffer                                                  |
| Week 14                                                 | Precipitation titration                                                                            |
| Week 15                                                 | electrochemistry                                                                                   |
| Week 16                                                 | Final exam                                                                                         |

| Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر |                                                                                                                                                                    |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                               | Material Covered                                                                                                                                                   |
| Week 1                                                        | Biosafety and chemistry lab equipment's, Titration Curves of Strong and Weak Acids and Bases, Acid-Base Titration, Using Conductivity to Find an Equivalence Point |
| Week 2                                                        | Rate Law Determination of the Crystal Violet, Determining the Free Chlorine Content of                                                                             |

|               |                                                                                                           |
|---------------|-----------------------------------------------------------------------------------------------------------|
|               | Swimming Pool Water                                                                                       |
| <b>Week 3</b> | Determining the Quantity of Iron in a Vitamin Tablet, Investigating Indicators                            |
| <b>Week 4</b> | Determining the Phosphoric Acid Content in Soft Drinks                                                    |
| <b>Week 5</b> | Oxidation-Reduction Titrations, Identifying a Pure Substance, The Decomposition of Hydrogen Peroxide      |
| <b>Week 6</b> | The Molar Mass of a Volatile Liquid, Baking Soda and Vinegar Investigations Revisited, Acid Rain, Buffers |
| <b>Week 7</b> | Final Exam , Titration of a Diprotic Acid: Identifying an Unknown                                         |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس |                                                                                                                                                                                                                                                                                                                                                                                |                           |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                          | Text                                                                                                                                                                                                                                                                                                                                                                           | Available in the Library? |
| <b>Required Texts</b>                                    | <b>1. General organic and biochemistry</b><br>Biochemistry 2008.Campbell fareel<br>1. <b>D. U. Silverthorn (2010)</b> Human physiology. 5 Edition.<br>2. Biochemistry 5 <sup>th</sup> edditiond , 2011, ritchard Harvey and Dennise Ferreier<br>3. Blackman, Southam, Lawrie, Williamson, Thompson, Bridgeman, Chemistry Core Concepts, 2nd Edition, Wiley ISBN: 9781742467078 |                           |
| <b>Recommended Texts</b>                                 | Check the new modern websites talking about the new modifications                                                                                                                                                                                                                                                                                                              |                           |
| <b>Websites</b>                                          |                                                                                                                                                                                                                                                                                                                                                                                |                           |

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

جامعة العلوم العراقية

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

| Module Information                 |                        |                               |                                                                                                                                                                                                                                          |
|------------------------------------|------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                        |                               |                                                                                                                                                                                                                                          |
| Module Title                       | Arabic 2               |                               | Module Delivery                                                                                                                                                                                                                          |
| Module Type                        | S                      |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | UOB                    |                               |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 2                      |                               |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 50                     |                               |                                                                                                                                                                                                                                          |
| Module Level                       | 2                      | Semester of Delivery          |                                                                                                                                                                                                                                          |
| Administering Department           | Biomedical Engineering | College                       | Faculty of Engineering                                                                                                                                                                                                                   |
| Module Leader                      | Nabil Mohammed Salman  | e-mail                        | dr.nabil.m.salman@baghdadcollege.edu.iq                                                                                                                                                                                                  |
| Module Leader's Acad. Title        | lecturer               | Module Leader's Qualification | PhD                                                                                                                                                                                                                                      |
| Module Tutor                       |                        | e-mail                        |                                                                                                                                                                                                                                          |
| Peer Reviewer Name                 | Nabil Mohammed Salman  | e-mail                        | dr.nabil.m.salman@baghdadcollege.edu.iq                                                                                                                                                                                                  |
| Scientific Committee Approval Date | 9/2025                 | Version Number                | 1                                                                                                                                                                                                                                        |

| Relation with other Modules       |                 |          |  |
|-----------------------------------|-----------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                 |          |  |
| Prerequisite module               | Arabic 1 UOB101 | 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               | <p>تدريس اللغة العربية يهدف إلى تحقيق الأهداف التالية:</p> <p>1- تعليم اللغة العربية بقواعدها الصحيحة كما وردت في القرآن الكريم .</p> <p>2- تطوير مهارات الاستماع والتحدث والقراءة والكتابة باللغة العربية الفصحى .</p> <p>3- تنمية الملكة اللغوية وقدرات التفكير والتحليل عن طريق دراسة الأدب والشعر والنثر.</p> |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                             | <p>4- تجاوز الكثير من الاخطاء الشائعة في لغتنا العربية وفي لغة البحث الاكاديمي ولغة الحوار والتخاطب .</p> <p>5- معرفة الفروق اللغوية بين الكلمات المتشابهة واختلاف معانيها في القران الكريم .</p> <p>6- بيان الظواهر اللغوية التي تميزت بيها لغتنا العربية عن باقي اللغات الاخرى مثل الترادف والتضاد والاشتراك اللفظي والتعريب وغيرها .</p> <p>7- تطوير مهارات الكتابة بصورة صحيحة وتجاوز الاخطاء التي تقع في كتابة الهمزة والضاد والطاء والتاء المربوطة والهاء والتاء الطويلة وغيرها .</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <p>تدريس اللغة العربية ينتج عدة مخرجات، منها:</p> <ol style="list-style-type: none"> <li>1- تحسين مهارات القراءة والكتابة.</li> <li>2- تطوير مهارات التحدث والاستماع.</li> <li>3- تعزيز المعرفة بالثقافة العربية.</li> <li>4- تنمية المهارات التفكيرية.</li> <li>5- إبراز الهوية العربية.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <p>تعريف الطلاب بأهمية اللغة العربية وتعريف الطلاب بالفروق بين علم النحو والصرف والصوت (4 ساعة)</p> <p>تعريف الطلاب بالجملة الفعلية والجملة الاسمية بيان عناصر كل جملة بدءاً بالفعل من حيث اللزوم والتعدي (4 ساعة)</p> <p>الفعل من حيث الزمن ماضي ومضارع وأمر، حالات بناء الفعل الماضي (4 ساعة)</p> <p>حالات الفعل المضارع من حيث: رفع ونصب الفعل المضارع وعلاماته (4 ساعة)</p> <p>حالات الفعل المضارع من حيث: جزم الفعل المضارع وعلاماته (4 ساعة)</p> <p>حالات الفعل المضارع من حيث: بناء الفعل المضارع وعلاماته (4 ساعة)</p> <p>حالات بناء فعل الأمر (4 ساعة)</p> <p>الفاعل وأنواعه وعلاماته (4 ساعة)</p> <p>المفعول به وأنواعه وعلاماته (4 ساعة)</p> <p>المبتدأ وأنواعه (4 ساعة)</p> <p>الخبر وأنواعه وتقديم الخبر على المبتدأ (4 ساعة)</p> <p>الأسماء الخمسة (4 ساعة)</p> <p>العدد (4 ساعة)</p> <p>الإملاء : (4 ساعة)</p> <p>كتابة الهمزة الأولية والوسطية والمتطرفة</p> <p>الفرق بين التاء المربوطة والهاء والتاء الطويلة</p> <p>الإملاء : (4 ساعة)</p> <p>الطاء والضاد والفرق بينهما من حيث المعنى والنطق</p> <p>مجموعة من الأخطاء الشائعة وبيان الصواب فيها</p> <p>علامات الترقيم.</p> |

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Strategies</b></p> | <p>توجد العديد من الاستراتيجيات التي يمكن استخدامها في تدريس اللغة العربية، ومن بينها:</p> <ol style="list-style-type: none"> <li>1- استخدام المواد التعليمية المناسبة: يجب على المعلم اختيار المواد التعليمية التي تناسب مستوى الطلاب وتحقيق أهداف التعلم.</li> <li>2- تشجيع الطلاب على المشاركة: يجب على المعلم تشجيع الطلاب على المشاركة في الحصص والتحدث باللغة العربية.</li> <li>3- استخدام التكنولوجيا: يمكن استخدام التكنولوجيا في تدريس اللغة العربية، مثل استخدام برامج التعلم عبر الإنترنت والأفلام والأغاني الشعرية .</li> </ol> |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>4- تقديم دروس متنوعة: يجب على المعلم تقديم دروس متنوعة لزيادة اهتمام الطلاب وتحفيزهم لتحسين مهاراتهم في اللغة.</p> <p>5- إظهار أهمية الثقافة: يجب على المعلم إظهار أهمية الثقافة العربية وتعريف الطلاب بالتقاليد والعادات العربية.</p> <p>6- تحفيز التفاعل: يجب على المعلم تحفيز التفاعل بين الطلاب وتشجيعهم على التواصل مع بعضهم البعض باللغة العربية.</p> <p>7- استخدام المناهج المناسبة: يجب على المدارس اختيار المناهج التي تناسب مستوى الطلاب وتحقيق أهداف التعلم في تدريس اللغة العربية.</p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                         |    |                                                                           |     |
|--------------------------------------------------------------------------------|----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا                                        |    |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       | 33 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       | 2   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 17 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 1.1 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | 50 |                                                                           |     |

| Module Evaluation           |                     |             |                  |          |                           |
|-----------------------------|---------------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية       |                     |             |                  |          |                           |
|                             |                     | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| <b>Formative assessment</b> | <b>Quizzes</b>      | 2           | 20% (10)         | 1 and 5  | L.N; 1, 2, 4, and 5       |
|                             | <b>Assignments</b>  | 2           | 10% (10)         | 3 and 7  | L.N; 3, 4, 6 and 7        |
|                             | <b>Projects</b>     |             |                  |          |                           |
|                             | <b>Report</b>       | 1           | 10% (10)         | 13       | L.N; 8, 9 and 11.         |
| <b>Summative assessment</b> | <b>Midterm Exam</b> | 2hr         | 10% (10)         | 7        | L.N; 1 – 7.               |
|                             | <b>Final Exam</b>   | 3hr         | 50% (50)         | 16       | All.                      |
| <b>Total assessment</b>     |                     |             | 100% (100 Marks) |          |                           |

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

| Material Covered                                                                                                               |            |
|--------------------------------------------------------------------------------------------------------------------------------|------------|
| تعريف الطلاب بأهمية اللغة العربية وتعريف الطلاب بالفروق بين علم النحو والصرف والصوت                                            | الأسبوع 1  |
| تعريف الطلاب بالجملة الفعلية والجملة الاسمية بيان عناصر كل جملة بدأ بالفعل من حيث اللزوم والتعدي                               | الأسبوع 2  |
| الفعل من حيث الزمن ماضي ومضارع وأمر، حالات بناء الفعل الماضي                                                                   | الأسبوع 3  |
| حالات الفعل المضارع من حيث: رفع ونصب الفعل المضارع وعلاماته                                                                    | الأسبوع 4  |
| حالات الفعل المضارع من حيث: جزم الفعل المضارع وعلاماته                                                                         | الأسبوع 5  |
| حالات الفعل المضارع من حيث: بناء الفعل المضارع وعلاماته                                                                        | الأسبوع 6  |
| حالات بناء فعل الأمر                                                                                                           | الأسبوع 7  |
| الفاعل وأنواعه وعلاماته                                                                                                        | الأسبوع 8  |
| المفعول به وأنواعه وعلاماته                                                                                                    | الأسبوع 9  |
| المبتدأ وأنواعه                                                                                                                | الأسبوع 10 |
| الخبر وأنواعه وتقديم الخبر على المبتدأ                                                                                         | الأسبوع 11 |
| الأسماء الخمسة                                                                                                                 | الأسبوع 12 |
| العدد                                                                                                                          | الأسبوع 13 |
| الإملاء :<br>كتابة الهمزة الأولية والوسطية والمتطرفة<br>الفرق بين التاء المربوطة والتاء الطويلة                                | الأسبوع 14 |
| الإملاء :<br>الظاء والضاد والفرق بينهما من حيث المعنى والنطق<br>مجموعة من الأخطاء الشائعة وبيان الصواب فيها<br>علامات الترقيم. | الأسبوع 15 |
| أسبوع تحضير قبل الامتحان النهائي                                                                                               | الأسبوع 16 |

## Learning and Teaching Resources

### مصادر التعلم والتدريس

| Text              | Available in the Library?                   |
|-------------------|---------------------------------------------|
| Required Texts    | ( النحو الوافي ) تأليف عباس حسن . نعم       |
| Recommended Texts | ( التطبيق النحوي ) تأليف عبده الراجحي . نعم |
| Websites          |                                             |

## Grading Scheme

| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                                         |                         |                     |          |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade                   | التقدير             | Marks %  | Definition                            |
| <b>Success Group<br/>(50 - 100)</b>                                                                                                                                                                                                                                                                                                                                                  | <b>A</b> - Excellent    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>B</b> - Very Good    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>C</b> - Good         | جيد                 | 70 - 79  | Sound works with notable errors       |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>D</b> - Satisfactory | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>E</b> - Sufficient   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| <b>Fail Group<br/>(0 – 49)</b>                                                                                                                                                                                                                                                                                                                                                       | <b>FX</b> – Fail        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>F</b> – Fail         | راسب                | (0-44)   | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                         |                     |          |                                       |
| <b>Note:</b> 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                       | Mathematics II1        |                               | Module Delivery                                                                                                                                                                                                                          |
| Module Type                        | Basic                  |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | BME211                 |                               |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 6                      |                               |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 150                    |                               |                                                                                                                                                                                                                                          |
| Module Level                       | 2                      | Semester of Delivery          | 1                                                                                                                                                                                                                                        |
| Administering Department           | Biomedical Engineering | College                       | Faculty of Engineering                                                                                                                                                                                                                   |
| Module Leader                      | Adel Nahi Alwan        | e-mail                        | Math79@baghdadcollege.edu.iq                                                                                                                                                                                                             |
| Module Leader's Acad. Title        | Assist. Lecturer       | Module Leader's Qualification | MSC                                                                                                                                                                                                                                      |
| Module Tutor                       | Raji Toma Naser        | e-mail                        | rajitoma@baghdadcollege.edu.iq                                                                                                                                                                                                           |
| Peer Reviewer Name                 | Adel Nahi Alwan        | e-mail                        | Math79@baghdadcollege.edu.iq                                                                                                                                                                                                             |
| Scientific Committee Approval Date | 9/2025                 | Version Number                | 1                                                                                                                                                                                                                                        |

| Relation with other Modules       |               |          |   |
|-----------------------------------|---------------|----------|---|
| العلاقة مع المواد الدراسية الأخرى |               |          |   |
| Prerequisite module               | Mathematics I | Semester | 1 |
| Co-requisites module              | Mathematics I | Semester | 2 |

| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br><b>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br><b>أهداف المادة الدراسية</b>                                                                               | <p>Our Main Goal in this module is to introduce a number of many concepts motivated through mathematical applications. These applications build from the basic mathematical content to create a path into whole fields that are rooted in calculus. Also added material on applications of differentials and partial derivatives as a definitive application for both of these topics in thermodynamics, physically, ... etc.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Module Learning Outcomes</b><br><b>مخرجات التعلم للمادة الدراسية</b>                                                          | <ol style="list-style-type: none"> <li>1 Learn how to write and graph parametric equations in polar form, and see how calculus can be used to study these graphs. Analyze and write equations of a parabola, ellipse, and hyperbola in polar form.</li> <li>2 Sketch a curve represented by parametric equations and use them to find the slope of a tangent line to a curve and the arc length of a curves.</li> <li>3 Find length, area of a region bounded by a polar graph.</li> <li>4 Introduces vectors in two-dimensional and in three-dimensional.</li> <li>5 Write vectors, perform basic vector operations, and represent them graphically.</li> <li>6 Plot points in three-dimensional coordinate system, analyze vectors in space.</li> <li>7 Find the dot product and cross product of two vectors (in plane or in space).</li> <li>8 Recognize and write equations of cylindrical and quadric surfaces and of surfaces of revaluation.</li> <li>9 Use cylindrical and spherical coordinates to represent surfaces in space.</li> <li>10 Analyze and sketch a space curve represented by a vector-valued functions and applied limits, continuity, differentiate and integrate to them.</li> <li>11 Describe velocity and acceleration associated with a vector-valued function and used them to analyze projectile motion, arc length, curvature of curve.</li> <li>12 Introduces functions of more than one independent variables. Find limit, continuity, partial derivative, derivative implicitly, total differential by using chain rule.</li> <li>13 Introduces double integrals over regions in plane and triple integrals over regions in space. Evaluate area, volume, mass, first moments, second moment or moment of inertia, also evaluate double (triple) in polar coordinate (cylindrical and spherical coordinates).</li> </ol> |
| <b>Indicative Contents</b><br><b>المحتويات الإرشادية</b>                                                                         | <p>Instructional content includes the following.</p> <p>Part A - Polar coordinates<br/>Define Polar coordinates and how to find Areas, Lengths, and Conic Sections. Also, introduce and represent Three-Dimensional Space with the application to find Distance and Spheres.</p> <p>Part B – Vectors<br/>Represent Vectors in two and three-dimensional spaces, also study how to use them to find the magnitude, scalar, dot product, and cross product in both spaces. Describe Vector-Valued Functions of Single Variable, Limit and Continuity, Derivative, Integration, and Parametric Equations.</p> <p>Part C - Partial derivative<br/>Define functions of two or more independent variables, find limit, continuity,</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>and differentiable, Introduce Chain Rule, Jacobian, Normal, and Tangent Planes to Surfaces, and the Gradient of these functions.</p> <p>Part D – Double, Triple Integrals</p> <p>Properties, Volume, Reversing the Order of Integration, and how to find Mass, Average Value, First Moments, Center, Moments of inertia and Radii of gyration, by using many Coordinates. Also introduce and find the area by using Lagrange, Trapezoidal, Simpson's Rule.</p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <ol style="list-style-type: none"> <li>1 Using the Blackboard and Wide Screen to Introduce the Students to this Module, we also let the students to participate in the problem solving process in the class and by giving them homework;</li> <li>2 Lectures where the students have some printed notes/handouts and may annotate, or expand these during a spoken lecture;</li> <li>3 Personal Video Lecture material placed on YouTube or other e-learning environment;</li> <li>4 External Printed lectures or References from industry;</li> <li>5 Obviously, Small group tutorial sessions inside the class make more ideas useful and easier to understand how to solve the Material of this module;</li> <li>6 Question and answer sessions during lectures or staff Office Hours;</li> <li>7 Guided reading of texts, journal articles ... etc., for individual and group projects.</li> </ol> |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا       |     |                                                                           |   |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|---|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 63  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 87  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا |   |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 150 |                                                                           |   |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                        |             |                |           |                           |
|---------------------------------------------------|------------------------|-------------|----------------|-----------|---------------------------|
|                                                   |                        | Time/Number | Weight (Marks) | Week Due  | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | <b>Quizzes</b>         | 4           | 20(20%)        | 4,7,10,14 | 1-2,11,12,13              |
|                                                   | <b>Assignments</b>     | 1           | 5(5%)          | 8         | 10                        |
|                                                   | <b>Projects / Lab.</b> |             |                |           |                           |
|                                                   | <b>Report</b>          | 1           | 5(5%)          | 15        | 7                         |
| <b>Summative</b>                                  | <b>Midterm Exam</b>    | 2           | 20 (20 %)      | 6,12      | 3-6,8-9                   |

|                  |            |   |                  |    |    |
|------------------|------------|---|------------------|----|----|
| assessment       | Final Exam | 1 | 50 (50 %)        | 16 | 14 |
| Total assessment |            |   | 100% (100 Marks) |    |    |

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري |                                                                                                                                                           |
|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                            | Material Covered                                                                                                                                          |
| Week 1                                                     | Review Polar coordinates and Graphing it, Find Areas, Lengths and Conic Sections by using Polar coordinates, Three-Dim Space, Distance and Spheres in it. |
| Week 2                                                     | Vectors, magnitude or length, scalar and dot product, cross product, lines and planes in space.                                                           |
| Week 3                                                     | Vector Valued Functions of Single Variable, Limit and Continuity.                                                                                         |
| Week 4                                                     | Derivative, Integration, velocity, acceleration, Curvature, Unit Normal Vector N.                                                                         |
| Week 5                                                     | Parametric Equations for Ideal Projectile Motion, Arc Length and Unit Tangent Vector.                                                                     |
| Week 6                                                     | Partial derivative: functions of two or more independent variables and limit.                                                                             |
| Week 7                                                     | Partial derivatives, continuity and differentiable functions.                                                                                             |
| Week 8                                                     | Total Differentia, Chain Rule and Jacobian.                                                                                                               |
| Week 9                                                     | Normal Lines and Tangent Planes to Surfaces, the Gradient of Function.                                                                                    |
| Week 10                                                    | Finding Mass, Center of Mass, Moment of Inertia, Radius of Gyration                                                                                       |
| Week 11                                                    | Double, Triple Integrals, Properties, Volume and Reversing the Order of Integration.                                                                      |
| Week 12                                                    | Mass, Average Value, First Moments, Center, Moments of inertia and Radii of gyration.                                                                     |
| Week 13                                                    | Double Integrals in Polar Form.                                                                                                                           |
| Week 14                                                    | Triple Integrals in Cylindrical and Spherical Coordinates.                                                                                                |
| Week 15                                                    | Lagrange, Trapezoidal, Simpson's Rule                                                                                                                     |
| Week 16                                                    | Final Exam.                                                                                                                                               |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس |                                                                                                                                                        |                           |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                          | Text                                                                                                                                                   | Available in the Library? |
| Required Texts                                           | Thomas_Calculus_11 <sup>th</sup> Edition                                                                                                               | Yes                       |
| Recommended Texts                                        | 1. Calculus-Courses-Adams 2010<br>2. Calculus-Edwards2010<br>3. Differential Equations for Engineers 2010<br>4. Multivariable Calculus & Analysis 2010 | No                        |
| Websites                                                 |                                                                                                                                                        |                           |

| Grading Scheme<br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                       |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(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<br>(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  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                  |                     |           |                                       |
| <b>Note:</b> 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                       | Mechanics of Materials |                               | Module Delivery                                                                                                                                                                                                                                     |
| Module Type                        | Basic                  |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input checked="" type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | BME215                 |                               |                                                                                                                                                                                                                                                     |
| ECTS Credits                       | 5.0                    |                               |                                                                                                                                                                                                                                                     |
| SWL (hr/sem)                       | 125                    |                               |                                                                                                                                                                                                                                                     |
| Module Level                       | 2                      | Semester of Delivery          |                                                                                                                                                                                                                                                     |
| Administering Department           | Biomedical Engineering | College                       | Faculty of Engineering                                                                                                                                                                                                                              |
| Module Leader                      | Manal naser jebur      | e-mail                        | Manalpower009@gmail.com                                                                                                                                                                                                                             |
| Module Leader's Acad. Title        | Assist.Lecture         | Module Leader's Qualification | MSC                                                                                                                                                                                                                                                 |
| Module Tutor                       | Eman qassim jebur      | e-mail                        | emanqassim43@gmail.com                                                                                                                                                                                                                              |
| Peer Reviewer Name                 | Manal naser jebur      | e-mail                        | Manalpower009@gmail.com                                                                                                                                                                                                                             |
| Scientific Committee Approval Date | 2025/9                 | Version Number                | 1                                                                                                                                                                                                                                                   |

| Relation with other Modules       |              |          |   |
|-----------------------------------|--------------|----------|---|
| العلاقة مع المواد الدراسية الأخرى |              |          |   |
| Prerequisite module               | Statics      | Semester | 1 |
| Co-requisites module              | Biomaterials | Semester | 1 |

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                    |
| Module Aims<br>أهداف المادة الدراسية                     | <p>The aim of this course is to learn students to be able to solve the solid mechanics problems for biomedical applications. The course covers exercises corresponding the following topics:</p> <ol style="list-style-type: none"> <li>1. Introduction of the stresses and strains.</li> <li>2. Know the theory and background of fundamental concepts as stresses and</li> </ol> |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                             | <p>strains, deformations and displacements, elasticity and inelasticity, strain energy, and load-carrying capacity.</p> <p>3. Concepts underlie the design and analysis of a huge variety of mechanical and structural systems.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <p>The expected outcomes for this course will be:</p> <ol style="list-style-type: none"> <li>1. Learn to calculate the normal and shear of the stress and strain for any biomedical solid system.</li> <li>2. Calculate the internal stresses for any medical system that applied by external forces.</li> <li>3. Calculate the deflection of the deformable bodies applied by the types of loads such as axil, torsion and bending load.</li> <li>4. Understand the strain energy which caused by internal stresses.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                    |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <p>The indicative contents for this course contents:</p> <p><b>Part A (Basic define of stress and strain):</b></p> <p>In this part the starting point of learning is to understand the main relation of stress and strain as well the types normal, shear and bearing, for any medical system prior to any mechanical analysis. This stresses will be produced by the external forces.</p> <p><b>Part B (Types of external loads and their stresses production):</b></p> <p>In this part the analysis will be internally for the medical system, here student will learn how to calculate the stresses, the normal and shear stress and strain for the general types of load (normal, shear, axial, torsion and bending)</p> <p><b>Part C (Strain Energy)</b></p> <p>In this part the strain energy resultant by the internal stresses will calculate. additional effect such as thermal load will be consider.</p> |

| <p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Strategies</b></p>                                                          | <p>The main strategies that will be used in this course module are:</p> <ol style="list-style-type: none"> <li>1. Review the previous information and mechanical skills that the students have already gained in the first module.</li> <li>2. The starting here, is to evaluate the final information and start to add the missing engineering sense and behaviour through specifying a template for the solution procedure.</li> <li>3. In class work, tutorials, work in groups, solve in a minute challenges with the standard lecture notes presentation are activities will be done through the structural and unstructured working load.</li> <li>4. Critical thinking, brain storm and interactivity during the course work and subject's discussions.</li> </ol> |

| <p><b>Student Workload (SWL)</b></p> |
|--------------------------------------|
|--------------------------------------|

| الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا                                        |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       | 48  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       | 3   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 77  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 5.1 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | 125 |                                                                           |     |

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

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري |                                     |
|------------------------------------------------------------|-------------------------------------|
|                                                            | Material Covered                    |
| Week 1                                                     | Mechanical Properties of Materials  |
| Week 2                                                     | Normal Stress and Strain            |
| Week 3                                                     | Shear Stress and Strain             |
| Week 4                                                     | Axially Loaded Members              |
| Week 5                                                     | Statically Indeterminate Structures |
| Week 6                                                     | Thermal Effects and Strain Energy.  |

|                |                                          |
|----------------|------------------------------------------|
| <b>Week 7</b>  | <b>Midterm Exam.</b>                     |
| <b>Week 8</b>  | Torsion.                                 |
| <b>Week 9</b>  | Stresses and Strains in Pure Shear.      |
| <b>Week 10</b> | Shear Forces and Bending Moments.        |
| <b>Week 11</b> | Shear-Force and Bending-Moment Diagrams. |
| <b>Week 12</b> | Report discussions.                      |
| <b>Week 13</b> | Stresses in Beams (Basic Topics)         |
| <b>Week 14</b> | Normal Stresses in Beams                 |
| <b>Week 15</b> | Shear Stresses in Beams                  |
| <b>Week 16</b> | <b>Final Exam.</b>                       |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                         |
|-------------------------------------------------------------------------|-------------------------|
|                                                                         | <b>Material Covered</b> |
| <b>Week 1</b>                                                           |                         |
| <b>Week 2</b>                                                           |                         |
| <b>Week 3</b>                                                           |                         |
| <b>Week 4</b>                                                           |                         |
| <b>Week 5</b>                                                           |                         |
| <b>Week 6</b>                                                           |                         |
| <b>Week 7</b>                                                           |                         |

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                                               |                                  |
|-----------------------------------------------------------------|---------------------------------------------------------------|----------------------------------|
|                                                                 | <b>Text</b>                                                   | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                           | 1- Mechanics of Materials (James M. Gere and Barry J. Goodno) | Yes                              |
|                                                                 | 2- Mechanics of Materials (R. C. Hibbeler)                    | Yes                              |
| <b>Recommended Texts</b>                                        | Mechanics of Materials (Ferdinand P. Beer et. al.)            | Yes                              |
| <b>Websites</b>                                                 |                                                               |                                  |

| Grading Scheme<br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                       |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(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<br>(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  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                  |                     |           |                                       |
| <b>Note:</b> 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                       | Crimes of Baath's regime in Iraq<br>جرائم نظام البعث في العراق |                               | Module Delivery                                                                                                                                                                                                                          |                                |
| Module Type                        | S                                                              |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                |
| Module Code                        | UOB                                                            |                               |                                                                                                                                                                                                                                          |                                |
| ECTS Credits                       | 2                                                              |                               |                                                                                                                                                                                                                                          |                                |
| SWL (hr/sem)                       | 50                                                             |                               |                                                                                                                                                                                                                                          |                                |
| Module Level                       | 2                                                              | Semester of Delivery          |                                                                                                                                                                                                                                          | 1                              |
| Administering Department           | Biomedical Engineering                                         | College                       | Faculty of Engineering                                                                                                                                                                                                                   |                                |
| Module Leader                      | Marwa Jassim Abod                                              |                               | e-mail                                                                                                                                                                                                                                   | marwajoj994@gmail.com          |
| Module Leader's Acad. Title        | Assist. Lecturer                                               | Module Leader's Qualification | MSC                                                                                                                                                                                                                                      |                                |
| Module Tutor                       | Assist. prof. Raji Toma Naser                                  |                               | e-mail                                                                                                                                                                                                                                   | rajitoma@baghdadcollege.edu.iq |
| Peer Reviewer Name                 | Marwa jassim Abod                                              |                               | e-mail                                                                                                                                                                                                                                   | marwajoj994@gmail.com          |
| Scientific Committee Approval Date | 9/2025                                                         | Version Number                | 1                                                                                                                                                                                                                                        |                                |

### Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

|                             |      |                 |  |
|-----------------------------|------|-----------------|--|
| <b>Prerequisite module</b>  | None | <b>Semester</b> |  |
| <b>Co-requisites module</b> | None | <b>Semester</b> |  |

### Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>                | <p>تدريس جرائم نظام البعث في العراق يهدف إلى تحقيق العديد من الأهداف، ومن بين هذه الأهداف:</p> <ol style="list-style-type: none"> <li>1- تبصير الطالب الجامعي العراقي بمبادئ وأهداف هذا النظام الإجرامية من الناحية الإنسانية والاجتماعية وما ارتكبه من جرائم بحق المواطن العراقي ومخالفته لكافة القوانين الدولية الإنسانية.</li> <li>2- تشجيع المشاركة المجتمعية: يساعد تدريس مادة جرائم البعث على تشجيع المشاركة المجتمعية، وتطوير مفاهيم التفاعل والتأثير في المجتمع .</li> <li>3- نشر ثقافة الدفاع عن الحق ومقاومة الأنظمة الظالمة : يؤدي تدريس جرائم البعث إلى نشر ثقافة المقاومة والصبر لإحقاق الحق وقمع الظلم ، مما يؤدي إلى خلق جيل جديد من المواطنين المثابرين على بناء مجتمعات مستدامة.</li> <li>4- تطور مفاهيم التفكير: يُطور تدريس جرائم البعث مفاهيم التفكير لدى الطلاب، ويساعدهم على تحليل الأحداث والظواهر بشكل أفضل.</li> <li>5- تعزيز منظومة التحقيق والحقيقة يهدف تدريس هذه المادة إلى وتشجيع الطلاب على المشاركة في اتخاذ القرارات المستقبلية لبناء مجتمعات أكثر عدلاً وتنميةً.</li> </ol> |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>1- جعل الطالب أكثر وعي ومعرفة بالحقائق المزيفة التي كان ييئها ألام النظام البائد .</li> <li>2- تطوير الوعي بالحقوق والحريات الأساسية التي يتمتع بها كل فرد في المجتمع، والتي كانت ممنوعة عن اغلب افراد الشعب العراقي</li> <li>3- تعزيز الثقافة السياسية والتفكير النقدي في المجتمع.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

|                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                              | <p>4- تنمية مهارات الدفاع عن النفس والإصغاء لآراء الآخرين.</p> <p>5- تشجيع المشاركة المدنية والانخراط في عملية صنع القرارات.</p> <p>6- تحسين مستوى التسامح والاحترام المتبادل بين أفراد المجتمع.</p> <p>7- زيادة الوعي بأهمية حفظ سيادة القانون وضمان حصول كل فرد على حقوقه دون تمييز أو انتهاك.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p> | <p>م1/ جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005 (4 ساعة)</p> <p>م2/ جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005 (4 ساعة)</p> <p>م3/ جريمة قمع الانتفاضة الشعبانية (4 ساعة)</p> <p>م4/ الجرائم النفسية والاجتماعية واثارها وابرز انتهاكات النظام البعثي في العراق (4 ساعة)</p> <p>م5/ اثار الجرائم النفسية (4 ساعة)</p> <p>م6/ تدمير دور العبادة كالمساجد والحسينيات والكنائس (4 ساعة)</p> <p>م7/ انتهاكات القوانين العراقية (4 ساعة)</p> <p>م8/ الاخفاء القسري للمواطنين (4 ساعة)</p> <p>م9/ بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث (4 ساعة)</p> <p>م10/ الجرائم البيئية لنظام البعث في العراق (4 ساعة)</p> <p>م11/ مدينة حلبجة (4 ساعة)</p> <p>م12/ تدمير المدن والقرى ( سياسة الارض المحروقة ) (4 ساعة)</p> <p>م13/ تجريف بساتين النخيل والاشجار والمزروعات (4 ساعة)</p> <p>م14/ احداث مقابر الابداء الجماعية المرتكبة من النظام البعثي في العراق (4 ساعة)</p> <p>م15/ مقابر الابداء الجماعية ذات الصلة بالحرب العراقية الايرانية للمدة 1980 - 1988 (4 ساعة)</p> |

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <p>توفر وحدة جرائم البعث استكشافاً متعمقاً للمفاهيم والنظريات والممارسات الاجرامية الشنيعة المتعلقة بحقوق الإنسان والمواطن العراقي يوضح هذا الوصف الأكاديمي المجالات الرئيسية للدراسة ضمن هذه الوحدة ، ويسلط الضوء على الطبيعة متعددة التخصصات للحقل وأهميته للمجتمعات المعاصرة. من خلال مجموعة من الأطر النظرية ودراسات الحالة والتحليل النقدي ، يكتسب الطلاب فهماً شاملاً للنظام البعثي والنزعة الاجرامية المتأصلة</p> |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

|                                                                                |    |                                                                           |     |
|--------------------------------------------------------------------------------|----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 33 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 2   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 17 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 1.1 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 50 |                                                                           |     |

### Module Evaluation

تقييم المادة الدراسية

|                             |                     | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|-----------------------------|---------------------|-------------|----------------|----------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>      | 2           | 20% (10)       | 1and 5   | L.N; 1, 2, 4, and 5       |
|                             | <b>Assignments</b>  | 2           | 10% (10)       | 3 and 7  | L.N; 3, 4, 6 and 7        |
|                             | <b>Projects</b>     |             |                |          |                           |
|                             | <b>Report</b>       | 1           | 10% (10)       | 13       | L.N;8, 9 and 11.          |
| <b>Summative assessment</b> | <b>Midterm Exam</b> | 2hr         | 10% (10)       | 7        | L.N; 1 – 7.               |
|                             | <b>Final Exam</b>   | 3hr         | 50% (50)       | 16       | All.                      |

|                  |                  |  |  |
|------------------|------------------|--|--|
| Total assessment | 100% (100 Marks) |  |  |
|------------------|------------------|--|--|

| Delivery Plan (Weekly Syllabus)                                            |            |
|----------------------------------------------------------------------------|------------|
| المنهاج الاسبوعي النظري                                                    |            |
| Material Covered                                                           |            |
| جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005       | الأسبوع 1  |
| جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005 | الأسبوع 2  |
| جريمة قمع الانتفاضة الشعبانية                                              | الأسبوع 3  |
| الجرائم النفسية والاجتماعية واثارها وابرز انتهاكات النظام البعثي في العراق | الأسبوع 4  |
| اثار الجرائم النفسية                                                       | الأسبوع 5  |
| تدمير دور العبادة كالمساجد والحسينيات والكنائس                             | الأسبوع 6  |
| انتهاكات القوانين العراقية                                                 | الأسبوع 7  |
| الاخفاء القسري للمواطنين                                                   | الأسبوع 8  |
| بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث                       | الأسبوع 9  |
| الجرائم البيئية لنظام البعث في العراق                                      | الأسبوع 10 |
| مدينة حلبجة                                                                | الأسبوع 11 |
| تدمير المدن والقرى ( سياسة الارض المحروقة )                                | الأسبوع 12 |

|            |                                                                              |
|------------|------------------------------------------------------------------------------|
| الأسبوع 13 | تجريف بساتين النخيل والأشجار والمزروعات                                      |
| الأسبوع 14 | أحداث مقابر الإبادة الجماعية المرتكبة من النظام البعثي في العراق             |
| الأسبوع 15 | مقابر الإبادة الجماعية ذات الصلة بالحرب العراقية الإيرانية للمدة 1980 - 1988 |
| الأسبوع 16 | أسبوع تحضير قبل الامتحان النهائي                                             |

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

|                   | Text                                                                                                                                                                                                   | Available in the Library? |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Required Texts    | ارشيف مؤسسة الشهداء                                                                                                                                                                                    | نعم                       |
| Recommended Texts | احسان هندي، قوانين الاحتلال الحربي، حقوق السكان المدنيين في المناطق المحتلة وحمايتهم<br>الادارة السياسية دمشق 1972<br>منهاج وزارة التعليم العالي والبحث العلمي / جرائم نظام البعث في العراق 2023- 2024 | نعم                       |
| Websites          |                                                                                                                                                                                                        |                           |

### Grading Scheme

#### مخطط الدرجات

| Group                       | Grade         | التقدير | Marks %  | Definition                      |
|-----------------------------|---------------|---------|----------|---------------------------------|
| Success Group<br>(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 works with notable errors |

|                   |                         |                     |         |                                       |
|-------------------|-------------------------|---------------------|---------|---------------------------------------|
|                   | <b>D</b> - Satisfactory | متوسط               | 60 - 69 | Fair but with major shortcomings      |
|                   | <b>E</b> - Sufficient   | مقبول               | 50 - 59 | Work meets minimum criteria           |
| <b>Fail Group</b> | <b>FX</b> – Fail        | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| <b>(0 – 49)</b>   | <b>F</b> – 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                       | <b>Electric Circuits 2</b> |                               | Module Delivery                                                                                                                                                                                                                                     |
| Module Type                        | <b>Base</b>                |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>BME213</b>              |                               |                                                                                                                                                                                                                                                     |
| ECTS Credits                       | <b>6.0</b>                 |                               |                                                                                                                                                                                                                                                     |
| SWL (hr/sem)                       | <b>150</b>                 |                               |                                                                                                                                                                                                                                                     |
| Module Level                       | <b>2</b>                   | Semester of Delivery          | <b>1</b>                                                                                                                                                                                                                                            |
| Administering Department           | Biomedical Engineering     | College                       | Faculty of Engineering                                                                                                                                                                                                                              |
| Module Leader                      | Jehan Rasheed Majid        | e-mail                        | JehanRasheedmajeed@gmail.com                                                                                                                                                                                                                        |
| Module Leader's Acad. Title        | Assist. lecturer           | Module Leader's Qualification | M.SC                                                                                                                                                                                                                                                |
| Module Tutor                       | Eman qassim jebur          | e-mail                        | emanqassim43@gmail.com                                                                                                                                                                                                                              |
| Peer Reviewer Name                 | Jehan Rasheed Majid        | e-mail                        | JehanRasheedmajeed@gmail.com                                                                                                                                                                                                                        |
| Scientific Committee Approval Date | 9/2025                     | Version Number                | 1                                                                                                                                                                                                                                                   |

| Relation with other Modules       |        |          |  |
|-----------------------------------|--------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |        |          |  |
| Prerequisite module               | BME121 | Semester |  |
| Co-requisites module              | None   | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                                                                        | <ul style="list-style-type: none"> <li>To learn how to analyze electrical circuits and calculate different responses for different components in the circuit.</li> <li>Explain the working principle, construction, applications of AC machines and measuring instruments</li> </ul>                                                                                                                                                                                                                                                                                                                               |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية                                                   | <p>A1. To learn how to analyze electrical circuits and calculate different responses for different components in the circuit.</p> <p>A2. Students will be able to wire a basic circuit.</p> <p>A3. Students will be able to make measurements on a circuit.</p>                                                                                                                                                                                                                                                                                                                                                    |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                                                                  | <p>AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs]</p> <p>AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs]</p> <p>RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs]</p> |

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

| Student Workload (SWL)                                                  |     |                                                                    |     |
|-------------------------------------------------------------------------|-----|--------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا                                 |     |                                                                    |     |
| Structured SWL (h/sem)<br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 78  | Structured SWL (h/w)<br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 5   |
| Unstructured SWL (h/sem)<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 72  | Unstructured SWL (h/w)<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4.8 |
| 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           | 20% (10)         | 5, 10      | LO # 3.5, 6, 9, 11 and 13 |
|                       | Assignments     | 2           | 6% (10)          | 2, 12      | LO # 3, 5, 6 and 9        |
|                       | Projects / Lab. | 1           | 6% (10)          | Continuous | All                       |
|                       | Report          | 1           | 8% (10)          | 13         | LO # 6, 9 and 13          |
| Summative assessment  | Midterm Exam    | 2 hr        | 10% (10)         | 7          | LO # 1-6                  |
|                       | Final Exam      | 3hr         | 50% (50)         | 16         | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |            |                           |

| Delivery Plan (Weekly Syllabus) |                         |
|---------------------------------|-------------------------|
| المناهج الاسبوعي النظري         |                         |
|                                 | Material Covered        |
| Week 1                          | A. C component          |
| Week 2                          | A,C connection circuit  |
| Week 3                          | Mix connection          |
| Week 4                          | Phasor representation   |
| Week 5                          | Average. values         |
| Week 6                          | R.M.S. values           |
| Week 7                          | <b>Second Term Exam</b> |
| Week 8                          | Series A.C. circuits    |
| Week 9                          | parallel A.C. circuits  |

|                |                                           |
|----------------|-------------------------------------------|
| <b>Week 10</b> | Series A.C. power                         |
| <b>Week 11</b> | parallel A.C. power                       |
| <b>Week 12</b> | Nodal Analysis                            |
| <b>Week 13</b> | Mesh Analysis A.C                         |
| <b>Week 14</b> | Superposition theorem A.C                 |
| <b>Week 15</b> | Thevenin and Norton theorem and resonance |
| <b>Week 16</b> | Final exam                                |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|                | Material Covered                               |
|----------------|------------------------------------------------|
| <b>Week 1</b>  | Series RL Circuit                              |
| <b>Week 2</b>  | Parallel RL Circuit                            |
| <b>Week 3</b>  | Series RC Circuit                              |
| <b>Week 4</b>  | Parallel RC Circuit                            |
| <b>Week 5</b>  | Series RLC Circuit                             |
| <b>Week 6</b>  | Mid exam                                       |
| <b>Week 7</b>  | Parallel RLC Circuit                           |
| <b>Week 8</b>  | Kirchhoff's laws<br>KVL & KCL                  |
| <b>Week 9</b>  | Nodal Analysis                                 |
| <b>Week 10</b> | Mesh Analysis                                  |
| <b>Week 11</b> | Super Position Theorem                         |
| <b>Week 12</b> | Thevenin Theorem                               |
| <b>Week 13</b> | Norton Theorem and Max. Power Transfer Theorem |
| <b>Week 14</b> | Resonance                                      |

| Learning and Teaching Resources |                                                                                                                                                                                               |                           |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| مصادر التعلم والتدريس           |                                                                                                                                                                                               |                           |
|                                 | Text                                                                                                                                                                                          | Available in the Library? |
| Required Texts                  | Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education fourth edition 2010                                                                                 | Yes                       |
| Recommended Texts               | DC Electrical Circuit Analysis: A Practical Approach, 2020, dissidents. James M. Fiore                                                                                                        | No                        |
| Websites                        | <a href="https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering">https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering</a> |                           |

| Grading Scheme                                                                                                                                                                                                                                                                                                                                                                       |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                                         |                  |                     |           |                                       |
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(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<br>(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  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                  |                     |           |                                       |
| <b>Note:</b> 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                       | Biomaterials Science              |                               | Module Delivery                                                                                                                                                                                                                          |                        |
| Module Type                        | Core                              |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                        |
| Module Code                        | BME214                            |                               |                                                                                                                                                                                                                                          |                        |
| ECTS Credits                       | 5.0                               |                               |                                                                                                                                                                                                                                          |                        |
| SWL (hr/sem)                       | 125                               |                               |                                                                                                                                                                                                                                          |                        |
| Module Level                       | 2                                 | Semester of Delivery          |                                                                                                                                                                                                                                          | 1                      |
| Administering Department           | Biomedical Engineering            | College                       | Faculty of Engineering                                                                                                                                                                                                                   |                        |
| Module Leader                      | Sura Qassim Amen                  |                               | e-mail                                                                                                                                                                                                                                   | Sura.qassim@yahoo.com  |
| Module Leader's Acad. Title        | Assist.lecturer                   | Module Leader's Qualification | M.Sc.                                                                                                                                                                                                                                    |                        |
| Module Tutor                       | Assist.lecturer Eman qassim jebur |                               | e-mail                                                                                                                                                                                                                                   | emanqassim43@gmail.com |
| Peer Reviewer Name                 | Sura Qassim Amen                  | e-mail                        | Sura.qassim@yahoo.com                                                                                                                                                                                                                    |                        |
| Scientific Committee Approval Date | 9/2025                            | Version Number                | 1                                                                                                                                                                                                                                        |                        |

| Relation with other Modules       |      |          |  |
|-----------------------------------|------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |      |          |  |
| Prerequisite module               |      | 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                     | <p>The purpose of this course is to present an overview of fundamental biomaterials. Topics include; Definition of biomaterials, Characterization of materials, Metallic implant, Ceramics implants, Polymers implants, Tissue response, and Biocompatibility.</p> <p>Physical properties of natural and synthetic (e.g. stainless steel, polymers) materials used in biological engineering applications are presented in this course. Topics will include microstructure and mechanical properties of typical biomaterials, quantification of advanced material properties and behaviors, fabrication, compatibility, biodegradation and mechanical failure. Typical applications will include processing of biomaterials as well as</p> |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | equipment and implant design.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | By the end of this course, you should be able to: <ol style="list-style-type: none"> <li>1. Analyze materials engineering problems specific to biomedical applications using a balance of mathematics, physics, chemistry, and physiologic considerations.</li> <li>2. Demonstrate a working knowledge of general properties (mechanical, chemical, physiological) of both synthetic and natural materials used in biomedical and biological engineering applications.</li> <li>3. Predict the stress/strain/time response of biological materials using mathematical equations.</li> <li>4. Demonstrate competency in using materials testing equipment to obtain mechanical properties of biological materials.</li> <li>5. Communicate effectively in a professional environment through technical reports and presentations.</li> </ol> |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | The indicative contents for this course contents: <ol style="list-style-type: none"> <li>1. The Structure of solids</li> <li>2. Characterization of materials</li> <li>3. Metallic implant materials</li> <li>4. Ceramic implant materials</li> <li>5. Polymer implant materials</li> <li>6. Composites as biomaterials</li> <li>7. Applications of Biomaterials</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | The main strategies that will be used in this course module are: <ol style="list-style-type: none"> <li>1. Lectures, student assignments, and examinations will emphasize the relationship of biomaterials characterization to the solution of biomaterials choice in medical device design and the identification of the origins of medical device performance failures</li> <li>2. The key issues of the interaction of biomaterials with the biological environment will be discussed in lectures. Techniques used to monitor the interaction of biomaterials with cells and biological molecules will be described. Specific FDA-related testing and requirements will be reviewed.</li> </ol> |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 63  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 62  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4.1 |
| <b>Total SWL (h/sem)</b><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           | 20% (20 Marks)   | 4 and 12 | Learning Objectives 1, 2 and 3 |
|                       | Assignments  | 2           | 5% (5 Marks)     | 5 and 13 | Learning Objectives 1, 2 and 3 |
|                       | Projects     |             |                  |          |                                |
|                       | Report       | 1           | 5% (5 Marks)     | 14       | Learning Objectives 1-5        |
| Summative assessment  | Midterm Exam | 1 (1h)      | 20% (20 Marks)   | 8        | Learning Objectives 1-4        |
|                       | Final Exam   | 1 (2h)      | 50% (50 Marks)   | 16       | All                            |
| Total assessment      |              |             | 100% (100 Marks) |          |                                |

| Delivery Plan (Weekly Syllabus) |                                                                                                                                          |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| المناهج الاسبوعي النظري         |                                                                                                                                          |
|                                 | Material Covered                                                                                                                         |
| Week 1                          | Introduction to Biomaterial                                                                                                              |
| Week 2                          | Atomics Bonding, Crystal lattice and Arrangement of Atoms                                                                                |
| Week 3                          | Mechanical Properties (Stress & Strain) and Mechanical Properties (Mechanical failure)                                                   |
| Week 4                          | Mechanical Properties (Fracture)                                                                                                         |
| Week 5                          | Mechanical Properties (Fatigue, Wear & Friction), Surface Properties & Adhesion                                                          |
| Week 6                          | Viscoelasticity (Theory and Applications)                                                                                                |
| Week 7                          | Phase Diagram (Building and Alloys)                                                                                                      |
| Week 8                          | <b>Midterm Exam.</b>                                                                                                                     |
| Week 9                          | Classification Metal Alloys & Metallic Implantation                                                                                      |
| Week 10                         | Metallic Biomaterials: Miscellaneous Others                                                                                              |
| Week 11                         | Corrosion of Metals (Types, Pourbaix Diagrams, Case Studies, Toxicity)                                                                   |
| Week 12                         | Polymer (Types, Classifications and Polymer Implants)                                                                                    |
| Week 13                         | Ceramic Material (Bioceramics, Bioactive and Bioresorbable Ceramics)                                                                     |
| Week 14                         | Composites Material (Classification, Structure, Property, Natural and Synthetic Composites)                                              |
| Week 15                         | Applications of Biomaterials in Hard and Soft Tissue Replacement<br>Electrical, Thermal, Piezoelectricity, Optical & Porosity Properties |
| Week 16                         | <b>Final Exam.</b>                                                                                                                       |

| Delivery Plan (Weekly Lab. Syllabus) |                  |
|--------------------------------------|------------------|
| المناهج الاسبوعي للمختبر             |                  |
|                                      | Material Covered |

|        |  |
|--------|--|
| Week 1 |  |
| Week 2 |  |
| Week 3 |  |
| Week 4 |  |
| Week 5 |  |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس |                                                                                                                                                                                  |                           |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                          | Text                                                                                                                                                                             | Available in the Library? |
| Required Texts                                           | 1. Joon Park R.S. Lakes, Biomaterials: An introduction, Third Edition: 2007 Springer Science.                                                                                    | Yes                       |
|                                                          | 2. An Integrated Approach W.D. Callister, Jr. and D. G. Rethwisch, Fundamentals of Materials Science and Engineering: 8 <sup>th</sup> Edition: John Wiley and Sons, Inc. (2010). | No                        |
| Recommended Texts                                        |                                                                                                                                                                                  |                           |
| Websites                                                 |                                                                                                                                                                                  |                           |

| Grading Scheme<br>مخطط الدرجات |                  |                     |           |                                       |
|--------------------------------|------------------|---------------------|-----------|---------------------------------------|
| Group                          | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(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<br>(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                       | Statics                     |                               | Module Delivery                                                                                                                                                                                                                                     |
| Module Type                        | Corse                       |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input checked="" type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | BME111                      |                               |                                                                                                                                                                                                                                                     |
| ECTS Credits                       | 6.0                         |                               |                                                                                                                                                                                                                                                     |
| SWL (hr/sem)                       | 150                         |                               |                                                                                                                                                                                                                                                     |
| Module Level                       | 1                           | Semester of Delivery          |                                                                                                                                                                                                                                                     |
| Administering Department           | Biomedical Engineering      | College                       | Faculty of Engineering                                                                                                                                                                                                                              |
| Module Leader                      | Mohammed Hameed Abdulhassen | e-mail                        | <a href="mailto:m.hameed.hassen97@baghdadcollege.edu.iq">m.hameed.hassen97@baghdadcollege.edu.iq</a>                                                                                                                                                |
| Module Leader's Acad. Title        | Assistant Lecturer          | Module Leader's Qualification | M.SC                                                                                                                                                                                                                                                |
| Module Tutor                       | Mohammed Hameed Abdulhassen | e-mail                        | <a href="mailto:m.hameed.hassen97@baghdadcollege.edu.iq">m.hameed.hassen97@baghdadcollege.edu.iq</a>                                                                                                                                                |
| Peer Reviewer Name                 | Mohammed Hameed Abdulhassen | e-mail                        | <a href="mailto:m.hameed.hassen97@baghdadcollege.edu.iq">m.hameed.hassen97@baghdadcollege.edu.iq</a>                                                                                                                                                |
| Scientific Committee Approval Date | 2025/11/01                  | Version Number                | 1                                                                                                                                                                                                                                                   |

| 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 |  |
|                                                          |  |

|                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Aims</b><br/>أهداف المادة الدراسية</p>                      | <p>The aim of this course is to learn students to be able to solve the basic mechanics problems for biomedical applications. The course covers exercises corresponding the following topics:</p> <ol style="list-style-type: none"> <li>1. Drawing the free body diagram for any systems and find out the external forces.</li> <li>2. Learn how to find the internal forces that causes the equilibrium state.</li> <li>3. Specify the center of gravity, the moment of inertia, and learn how to find the mechanical work and energy.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p><b>Module Learning Outcomes</b><br/>مخرجات التعلم للمادة الدراسية</p> | <p>The expected outcomes for this course will be:</p> <ol style="list-style-type: none"> <li>1. Learn to draw and calculate the force vectors with the equilibrium theory for any biomedical rigid system.</li> <li>2. Calculate the internal forces for any medical system that causes the equilibrium state.</li> <li>3. Calculate the center of mass effect (center of gravity), center of geometry (centroid), and moment of inertia.</li> <li>4. Understand the work and potential energy.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p><b>Indicative Contents</b><br/>المحتويات الإرشادية</p>                | <p>The indicative contents for this course contents:</p> <p><b>Part A (Basic free body diagram and force vector):</b></p> <p>In this part the starting point of learning is to understand the main idea behind drawing the Free body diagram (FBD), for any medical system prior to any mechanical analysis. This FBD will be affected by the external forces that should be analyzed through the use of the vector analysis to calculate both values and direction during the equilibrium state.</p> <p><b>Part B (Internal forces and their position of effect):</b></p> <p>In this part the analysis will be internally for the medical system, here student will learn how to calculate the friction, the normal and tangential forces and their position of effect. Center of mass (for gravity effect), center of geometry (centroid) and the moment of inertia (the effect of mass rotation in uniform speed).</p> <p><b>Part C (Work and potential Energy)</b></p> <p>In this part the vector analysis of the forces, the internal force calculation and the center of effect for the gravity will be collect all together to study the required Work to change the position for the mechanical parts of the medical system with the final evaluation of the potential energy.</p> |

| <p style="text-align: center;"><b>Learning and Teaching Strategies</b><br/>استراتيجيات التعلم والتعليم</p> |                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Strategies</b></p>                                                                                   | <p>The main strategies that will be used in this course module are:</p> <ol style="list-style-type: none"> <li>1. Review the previous information and mechanical skills that the students have already gained in the primary school.</li> </ol> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>2. The starting here, is to evaluate the final information and start to add the missing engineering sense and behaviour through specifying a template for the solution procedure.</p> <p>3. In class work, tutorials, work in groups, solve in a minute challenges with the standard lecture notes presentation are activities will be done through the structural and unstructured working load.</p> <p>4. Critical thinking, brain storm and interactivity during the course work and subject's discussions.</p> |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا              |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 63  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 87  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5.5 |
| <b>Total SWL (h/sem)</b><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      | 4           | 10% (10 Marks)   | 2, 4, 8 and 10  | Learning Objectives 1, 2, 3 and 4 |
|                                            | Assignments  | 4           | 10% (10 Marks)   | 3, 7, 10 and 13 | Learning Objectives 1, 2, 3 and 4 |
|                                            | Projects     | 1           | 5% (10 Marks)    | Continuous      | All                               |
|                                            | Report       | 1           | 5% (10 Marks)    | 12              | Learning Objectives 1, 2, 3 and 4 |
| Summative assessment                       | Midterm Exam | 1 (1h)      | 20% (10 Marks)   | 6               | Learning Objectives 1, 2          |
|                                            | Final Exam   | 1 (2h)      | 50% (50 Marks)   | 16              | All                               |
| Total assessment                           |              |             | 100% (100 Marks) |                 |                                   |

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

|         | Material Covered                                    |
|---------|-----------------------------------------------------|
| Week 1  | General principals and review of previous material. |
| Week 2  | Force vectors.                                      |
| Week 3  | Equilibrium.                                        |
| Week 4  | Force vector system and resultants.                 |
| Week 5  | Equilibrium of a Rigid Body.                        |
| Week 6  | Midterm Exam.                                       |
| Week 7  | Analysis of medical system.                         |
| Week 8  | Internal Forces.                                    |
| Week 9  | Friction.                                           |
| Week 10 | Center of Gravity and Centroid.                     |
| Week 11 | Center of Gravity and Centroid.                     |
| Week 12 | Report discussions.                                 |
| Week 13 | Moments of Inertia.                                 |
| Week 14 | Work and Energy.                                    |
| Week 15 | Work and Energy.                                    |
| Week 16 | Final Exam.                                         |

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

|        | Material Covered |
|--------|------------------|
| Week 1 |                  |
| Week 2 |                  |
| Week 3 |                  |
| Week 4 |                  |
| Week 5 |                  |
| Week 6 |                  |
| Week 7 |                  |

### Learning and Teaching Resources

| مصادر التعلم والتدريس |                                                                                                                                        |                           |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                       | Text                                                                                                                                   | Available in the Library? |
| Required Texts        | 1. Mariam, JL, Kraige, LG and Bolton JN, Engineering Mechanics, Volume 1, Statics, 9 <sup>th</sup> edition, John Wiley and sons, 2018. | Yes                       |
|                       | 2. Hibbeler RC, Engineering Mechanics, Statics, 15 <sup>th</sup> edition, Pearson Education, 2023.                                     | Yes                       |
| Recommended Texts     | Gross D, Ehlers W, Wriggers P, Schroder J, and Muller R, Statics Formula and Problems, Engineering Mechanics 1, Springer 2017.         | No                        |
| Websites              |                                                                                                                                        |                           |

| Grading Scheme<br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                       |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(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<br>(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  |
| <b>Note:</b> 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                       | Presentation skills    |                               | Module Delivery                                                                                                                                                                                                                          |
| Module Type                        | Supportive             |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input checked="" type="checkbox"/> Seminar |
| Module Code                        | BME117                 |                               |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 2                      |                               |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 50                     |                               |                                                                                                                                                                                                                                          |
| Module Level                       | 1                      | Semester of Delivery          |                                                                                                                                                                                                                                          |
| Administering Department           | Biomedical Engineering | College                       | Faculty of Engineering                                                                                                                                                                                                                   |
| Module Leader                      | Zainab Ghassan Hussein | e-mail                        | <a href="mailto:MSCZainab@baghdadcollege.edu.iq">MSCZainab@baghdadcollege.edu.iq</a>                                                                                                                                                     |
| Module Leader's Acad. Title        | Assistant Lecture      | Module Leader's Qualification | M.SC                                                                                                                                                                                                                                     |
| Module Tutor                       |                        | e-mail                        |                                                                                                                                                                                                                                          |
| Peer Reviewer Name                 | Zainab Ghassan Hussein | e-mail                        | <a href="mailto:MSCZainab@baghdadcollege.edu.iq">MSCZainab@baghdadcollege.edu.iq</a>                                                                                                                                                     |
| Scientific Committee Approval Date | 01/11/2025             | 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<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                                                                        | <ol style="list-style-type: none"> <li>1. To understand the basic concept of presentation skills.</li> <li>2. To be able to deliver research and academic presentation.</li> <li>3. To develop his/her communication skills and languages in affective matter.</li> <li>4. To have the ability of asking and answering research questions in a proper method.</li> <li>5. To understand how to evaluate in effective way a research or any other related subject presentation.</li> </ol>                                                                                                                                                                                                                                                                                                                |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية                                                   | <ol style="list-style-type: none"> <li>1. Confidence of speaking in front of audience.</li> <li>2. Develop eyes contact while speaking to deliver an effective presentation.</li> <li>3. Can perform and design presentation materials to attract listener.</li> <li>4. Use proper key word, sentences and images to deliver intensive information in a short period of time.</li> <li>5. Able to use the body language to assist delivering information.</li> <li>6. Adapt your language to your audience.</li> <li>7. Familiar with Microsoft power point to design a presentation slides.</li> <li>8. The student will understand what is presentation.</li> </ol>                                                                                                                                    |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                                                                  | <p>The Indicative content can be divided into two main types listed as follow:</p> <p><u>Part A: definition</u></p> <p>The philosophy of presentation, adapt presenter language to the audience, confidence while speaking, gathering the required information related to the subject, use the body language, effective presentation skills, use proper language to fit with the subject, voice control, understanding an audience.</p> <p><u>Part B: presentation design</u></p> <p>Define the software used to design presentation, highlight the important point for the presentation, time management while presenting, how to arrange ideas, presentation colors and flow charts, what are the parts of proper presentation, design complete presentation, presenting your design presentation.</p> |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                               | <p>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 examples form real life application.</p> |

| Student Workload (SWL)                                                         |    |                                                                           |  |
|--------------------------------------------------------------------------------|----|---------------------------------------------------------------------------|--|
| الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا                                        |    |                                                                           |  |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       | 18 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       |  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 32 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا |  |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | 50 |                                                                           |  |

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

| Delivery Plan (Weekly Syllabus) |                                                                                                          |
|---------------------------------|----------------------------------------------------------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                                                                          |
|                                 | Material Covered                                                                                         |
| Week 1                          | Introduction to presentation                                                                             |
| Week 2                          | The language of presentation, Problems and fears with Presentations, Qualities of an Effective Presenter |

|                |                                                                                       |
|----------------|---------------------------------------------------------------------------------------|
| <b>Week 3</b>  | Planning a Presentation, effective presentation skills                                |
| <b>Week 4</b>  | Body language while presenting                                                        |
| <b>Week 5</b>  | Introduction to Microsoft power point                                                 |
| <b>Week 6</b>  | The outlines of presentation design in power point, flowchart benefit, ideas delivery |
| <b>Week 7</b>  | Midterm exam                                                                          |
| <b>Week 8</b>  | Practicing on power point                                                             |
| <b>Week 9</b>  | Practicing on power point                                                             |
| <b>Week 10</b> | Practicing on power point                                                             |
| <b>Week 11</b> | Practicing on power point                                                             |
| <b>Week 12</b> | Arrangement of ideas to convert it in power point slides                              |
| <b>Week 13</b> | Selected topic presentation                                                           |
| <b>Week 14</b> | Selected topic presentation                                                           |
| <b>Week 15</b> | Selected topic presentation                                                           |
| <b>Week 16</b> | Preparatory week before the final Exam                                                |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|               | Material Covered |
|---------------|------------------|
| <b>Week 1</b> |                  |
| <b>Week 2</b> |                  |
| <b>Week 3</b> |                  |
| <b>Week 4</b> |                  |
| <b>Week 5</b> |                  |
| <b>Week 6</b> |                  |
| <b>Week 7</b> |                  |

### Learning and Teaching Resources

مصادر التعلم والتدريس

|  | Text | Available in the Library? |
|--|------|---------------------------|
|  |      |                           |

|                          |                                                                                                                                                                                                            |  |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Required Texts</b>    |                                                                                                                                                                                                            |  |
| <b>Recommended Texts</b> | Bradbury, A.J., 2006. <i>Successful presentation skills</i> (Vol. 111). Kogan Page Publishers.<br>McCarthy, P. and Hatcher, C., 2002. <i>Presentation skills: The essential guide for students</i> . Sage. |  |
| <b>Websites</b>          |                                                                                                                                                                                                            |  |

| Grading Scheme<br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                       |                         |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade                   | التقدير             | Marks (%) | Definition                            |
| <b>Success Group<br/>(50 - 100)</b>                                                                                                                                                                                                                                                                                                                                                  | <b>A - Excellent</b>    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>B - Very Good</b>    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>C - Good</b>         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>D - Satisfactory</b> | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>E - Sufficient</b>   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| <b>Fail Group<br/>(0 – 49)</b>                                                                                                                                                                                                                                                                                                                                                       | <b>FX – Fail</b>        | راسب (قيد المعالجة) | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>F – Fail</b>         | راسب                | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                         |                     |           |                                       |
| <b>Note:</b> 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                       | English Language       |                               | Module Delivery                                                                                                                                                                                                                          |                                    |
| Module Type                        | Supportive             |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                    |
| Module Code                        | UOB102                 |                               |                                                                                                                                                                                                                                          |                                    |
| ECTS Credits                       | 2                      |                               |                                                                                                                                                                                                                                          |                                    |
| SWL (hr/sem)                       | 50                     |                               |                                                                                                                                                                                                                                          |                                    |
| Module Level                       | 1                      | Semester of Delivery          |                                                                                                                                                                                                                                          | 1                                  |
| Administering Department           | Biomedical Engineering | College                       | Faculty of Engineering                                                                                                                                                                                                                   |                                    |
| Module Leader                      | Batool Nafea           |                               | e-mail                                                                                                                                                                                                                                   | batoolmajeed@baghdadcollege.edu.iq |
| Module Leader's Acad. Title        | Asst. Lect.            | Module Leader's Qualification | M.SC                                                                                                                                                                                                                                     |                                    |
| Module Tutor                       |                        |                               | e-mail                                                                                                                                                                                                                                   |                                    |
| Peer Reviewer Name                 | Batool Nafea           | e-mail                        | batoolmajeed@baghdadcollege.edu.iq                                                                                                                                                                                                       |                                    |
| Scientific Committee Approval Date | 01\11\2025             | Version Number                | 1                                                                                                                                                                                                                                        |                                    |

| Relation with other Modules       |     |          |  |
|-----------------------------------|-----|----------|--|
| العلاقة مع المواد الدراسية الأخرى |     |          |  |
| Prerequisite module               | N\A | Semester |  |
| Co-requisites module              | N\A | Semester |  |

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

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | The goal of this course is to measurably build on students' academic English Language skills by engaging them in listening, speaking, reading, writing and grammar learning activities that are relevant to real- World encounters in university and professional workplace environments.                                                                                                                                                                                                                                                                                                             |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | After this course students should be able to : <ol style="list-style-type: none"> <li>1. Acquire and use new academic vocabulary</li> <li>2. Demonstrate at – level understanding of grammar in speaking and writing</li> <li>3. Understand inconsistencies between pronunciation and spelling</li> <li>4. Accurately compose moderately complex sentences with basic transitions to connect ideas in spoken and written discourse</li> <li>5. Identify written and spoken patterns; including sequential process , cause and effect, compare and contrast, problem /solution narratives .</li> </ol> |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                               |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | The students will be engaged in a variety of learning activities that foster positive attitudes in using English Independent learning skills will be promoted via self- access learning modes |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

#### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

|                                                                                |    |                                                                           |  |
|--------------------------------------------------------------------------------|----|---------------------------------------------------------------------------|--|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 33 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       |  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 17 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا |  |
| <b>Total SWL (h/sem)</b><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      | 3           | 10% (10)         | 5,10                        | LO#1,2,10 and 11          |
|                       | Assignments  | 6           | 10%(10)          | 2,12                        | LO#3 ,4, 6 and 7          |
|                       | Projects     | 1           | 10%(10)          | Process till the final week | ALL                       |
|                       | Report       | 1           | 10%(10)          | 13                          | LO#5,8 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         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                 | <b>Material Covered</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Week 1</b>                   | Introduction & course description and expectation. Verbs review and how to use them correctly especially in speaking and writing. Listening to audio for information and asking for clarification . Students demonstrate listening, speaking, and grammar proficiencies to establish individual base-line needs assessments                                                                                                                                                                                                                                                                         |
| <b>Week 2</b>                   | <p>Explain strategies of how to use critical thinking skills in listening, as demonstrated in speaking and/or writing, such as</p> <ol style="list-style-type: none"> <li>Make predictions</li> <li>Listen for specific information</li> <li>Distinguish fact from opinion</li> <li>Recognize support of claims</li> <li>Recognize idioms, slang, sarcasm and humor</li> </ol> <p>Three parts of listening conversations (audios) will be used as a main pedagogical mean to achieve the lecture goals</p> <p>In addition, Grammar focus will explain about how to the part of speech correctly</p> |
| <b>Week 3</b>                   | <p>Discuss the main Strategies of reading comprehension for academic texts in general.</p> <p>Skimming, scanning, detailed reading, guessing unknown words from context,</p>                                                                                                                                                                                                                                                                                                                                                                                                                        |

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | understanding text organization, recognizing argument and counter-argument; distinguishing between main information and supporting detail, fact and opinion, hypothesis versus evidence; summarizing and note-taking.                                                                                                                                                                                                                                                  |
| <b>Week 4</b> | Explain in details what is the paragraph and the structure of the paragraph. The main idea , and how to write with keeping the unit and avoid informality and unnecessary Run-on in academic written paper. This course is designed to develop the student's skills in writing. To achieve students need to realize through writing exercises to practice correct sentence and paragraph structure working in pairs to search on specific topic and write a paragraph. |
| <b>Week 5</b> | Grammar and language function focus: Explain what is the article (definite & indefinite) and how to use them in sentence's structure. Brief explanation will be provides about the countable / uncountable and how to avoid the common Errors . In addition , Explain the quantifiers as an important concepts in regards to both grammar & vocabulary . Also show the differences among them to use correctly , especially in writing and express quantity            |
| <b>Week 6</b> | Writing paragraph follow – up. Show students how it is important to avoid the plagiarism. Peer-review for submitted paper is assigned.<br>Explain the transition words essential tools in writing academically and officially . Explain and show more examples of transition to help students to memorized and understand the meaning of each word                                                                                                                     |
| <b>Week 7</b> | Explain the passive voice and active voice and how to employ passive voice in academic writing.<br>Demonstrate effective speaking functions in small-group and whole-class discussions after that . Measure that in different topics and issues . Help students to recognize how :<br>a. Questions and requests (ask and answer)<br>b. Express agreement/disagreement<br>c. Ask for clarification                                                                      |
| <b>Week 8</b> | Explain how to write an academic essay. Essay content and structure (patterns of organization, paragraphing, discussion – argument/counter-argument, advantages and disadvantages, topic sentence and supporting ideas, coherence and cohesion, punctuation).                                                                                                                                                                                                          |
| <b>Week 9</b> | Demonstrate essential content academic words in depth. In addition, use instructional time to address the meanings of common words, phrases, and expressions .Show the differences in meaning in suing the same word with different ending , such as (ing) and (ed).                                                                                                                                                                                                   |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 10</b> | Writing essay follow-up. Explain how to write an essay about advantage and disadvantage .<br>Students are encouraged to search about their topics in pairs as effective strategies to improve writing skills and as a way for peer-review at the same time                                                                                                                                                                                                                    |
| <b>Week 11</b> | Discuss the topics of writing that have been chosen by students. Giving feedbacks and<br>Explain how to express their an opinion avoiding the personal and emotional expresses.<br>Giving a summary about the common mistakes in writing opinion essay                                                                                                                                                                                                                        |
| <b>Week 12</b> | Grammar focus on using subordinative conjunction as connectors to link two or more sentences and show how to provide Run-on in writing                                                                                                                                                                                                                                                                                                                                        |
| <b>Week 13</b> | Deadline of submitting the first draft of essay, discuss with students their main idea,<br>Samples of essays are showed as solid example to write effectively and avoid mistakes                                                                                                                                                                                                                                                                                              |
| <b>Week 14</b> | Speaking & discussion<br>Describe how to express ideas clearly and develop them in an organized manner (e.g. with a main idea, supporting details, and conclusion), including<br><ol style="list-style-type: none"> <li>1. Deliver short discussion (group of three) using effective delivery, visual aids, and outside sources</li> <li>2. Demonstrate use of level-appropriate grammar and academic vocabulary, including idioms, phrasal verbs, and transitions</li> </ol> |
| <b>Week 15</b> | <b>Explain the time clause. In addition to explain the three cases of using the conditional (if)</b>                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Week 16</b> | <b>Final draft submitting with Discussion</b>                                                                                                                                                                                                                                                                                                                                                                                                                                 |

Note : Students are expected to spend time studying outside the class, and we provide guidance, facilities and materials to help them develop their expertise as pre-intermediate language learners. For this course, they are asked to consolidate their class work, to read, watch or listen to material in English, to prepare exercises and activities for the class, to write assignments, undertake projects and generally acquire a repertoire of effective language learning strategies.

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|               | Material Covered |
|---------------|------------------|
| <b>Week 1</b> |                  |
| <b>Week 2</b> |                  |
| <b>Week 3</b> |                  |
| <b>Week 4</b> |                  |

|        |  |
|--------|--|
| Week 5 |  |
|--------|--|

| Learning and Teaching Resources<br>مصادر التعلم والتدريس |                                                          |                           |
|----------------------------------------------------------|----------------------------------------------------------|---------------------------|
|                                                          | Text                                                     | Available in the Library? |
| Required Texts                                           | Headway Plus                                             | yes                       |
| Recommended Texts                                        | Academic writing :from paragraph to essay                | yes                       |
| Websites                                                 | British Council website for Adult Learning<br>Purdue OWL |                           |

| Grading Scheme<br>مخطط الدرجات |                  |                     |           |                                       |
|--------------------------------|------------------|---------------------|-----------|---------------------------------------|
| Group                          | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(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<br>(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                       | Biology                                            |                      | Module Delivery                                                                                                                                                                                                                                     |                                   |
| Module Type                        | Supportive                                         |                      | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                   |
| Module Code                        | BME112                                             |                      |                                                                                                                                                                                                                                                     |                                   |
| ECTS Credits                       | 6                                                  |                      |                                                                                                                                                                                                                                                     |                                   |
| SWL (hr/sem)                       | 150                                                |                      |                                                                                                                                                                                                                                                     |                                   |
| Module Level                       | 1                                                  | Semester of Delivery |                                                                                                                                                                                                                                                     | 1                                 |
| Administering Department           | Biomedical Engineering                             |                      | College                                                                                                                                                                                                                                             | Faculty of Engineering            |
| Module Leader                      | Dr.MOHAMMED ABDULFATAH<br>A.RAHMAN AL-AYASH        |                      | e-mail                                                                                                                                                                                                                                              | dr.mohammed@baghdadcollege.edu.iq |
| Module Leader's Acad. Title        | Lecture                                            |                      | Module Leader's Qualification                                                                                                                                                                                                                       | Ph.D                              |
| Module lab                         | Dr.MOHAMMED ABDULFATAH<br>A.RAHMAN AL-AYASH        |                      | e-mail                                                                                                                                                                                                                                              | dr.mohammed@baghdadcollege.edu.iq |
| Peer Reviewer Name                 | Dr.MOHAMMED<br>ABDULFATAH<br>A.RAHMAN AL-<br>AYASH |                      | e-mail                                                                                                                                                                                                                                              | dr.mohammed@baghdadcollege.edu.iq |
| Scientific Committee Approval Date | 01\11\2025                                         | 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<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                                                                        | <p>The goal of Biology is to explain the physical and chemical factors that are responsible for the origin, development and progression of life. Biology course present tremendous challenges to both students&amp; teachers for acquisition of the basic facts is essential to the study of Biology, but also important for students to develop the ability to solve practical, real life problems related to the knowledge they have acquired.</p>                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية                                                   | <p>Graduates will be able to:</p> <ol style="list-style-type: none"> <li>1 Apply their knowledge and understanding of physical and biological laws, mathematics and numerical analysis in order to model Biomedical Engineering and similar systems;</li> <li>2 Explain the role of Biomedical Engineers in society and the constraints within which their engineering judgment will be exercised.</li> <li>3- Design, from requirement, market need or specification, a biomedical engineering device implant or system, up to the preliminary design stage, and present this design via a series of poster, written and oral presentations from both group and individual work;</li> <li>4. Use laboratory and workshop equipment to generate data, including both engineering and physiological measurements, with appropriate rigor;</li> </ol> |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم |                                                                                                                                                                  |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                               | <p>Staff involved in the degree program utilize a wide range of teaching methods that they deem the most appropriate for a particular course. These include:</p> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Lectures where the students write information presented to them via slide show, overhead or written by the lecturer;</li> <li>• Lectures where the students have some printed notes/handouts and may annotate, or expand these during a spoken lecture;</li> <li>• Small group and large group tutorial sessions;</li> <li>• Question and answer sessions during lectures or staff Office Hours;</li> <li>• Laboratory sessions.</li> </ul> |
|  | <p>1. Seminar presented and discussed.</p> <p><b>Assessment Methods to be used are:</b></p> <ul style="list-style-type: none"> <li>• Written examinations (Summative assessment);</li> <li>• Oral presentations of individual and group work;</li> <li>• Individual written project report(s) of both individual and group projects;</li> <li>• Homework;</li> <li>• Take home exams;</li> </ul>                                                                                     |

| Student Workload (SWL)                                                         |     |                                                                           |   |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|---|
| الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا                                        |     |                                                                           |   |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 93  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 6 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 57  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4 |
| <b>Total SWL (h/sem)</b><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         | 5           | 5%               | 3-10     | 2,4,6,8 and 10            |
|                       | Assignments     | 2           | 5%               | 3-12     | 5,7,9,11                  |
|                       | Projects / Lab. | 4           | 10%              | 2-7      | 2.4.6,7                   |
|                       | Report          | 7           | 5%               | 2        | 5,8,12                    |
| Summative assessment  | Midterm Exam    | 4 hr.       | 25%              | 7        | 1-7\7-12                  |
|                       | Final Exam      | 3 hr        | 50%              | 16       | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                                               |
|---------------------------------|---------------------------------------------------------------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                                                                               |
|                                 | Material Covered                                                                                              |
| Week 1                          | Introduction to Biology, sub-disciplines of biology, Life process, Hierarchal structure of life.              |
| Week 2                          | Cell, Cell membrane structure, functions.                                                                     |
| Week 3                          | Cell organelles and functions                                                                                 |
| Week 4                          | Nucleus, chromatine, chromosome, DNA, RNA, Gene Expression, Regulation of gene Expression, Growth factor.     |
| Week 5                          | Cell Division , Cell cycle phases                                                                             |
| Week 6                          | Transportation across cell membranes.                                                                         |
| Week 7                          | Passive transport, simple diffusion, Facilitated diffusion., Active transport, primary & secondary transport. |
| Week 8                          | Mid Exam                                                                                                      |
| Week 9                          | Introduction of nervous system, Function and division of the nervous system.                                  |
| Week 10                         | Neuron cell, Classification of neuron.,                                                                       |
| Week 11                         | Excitation & conduction.                                                                                      |
| Week 12                         | Action potential, refractory period,                                                                          |
| Week 13                         | Types of impulse, types of nerve fibers.                                                                      |
| Week 14                         | Synaptic transmission, types of synapse.                                                                      |
| Week 15                         | Neuroglia cells, types of glial cells.                                                                        |
| Week 16                         | Final Exam                                                                                                    |

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

|               | Material Covered                                                     |
|---------------|----------------------------------------------------------------------|
| <b>Week 1</b> | Introduction to laboratory biology, terminology                      |
| <b>Week 2</b> | Equipment and microscopes                                            |
| <b>Week 3</b> | Laboratory biosafety                                                 |
| <b>Week 4</b> | Specimens and collections, preparation slides and models for testing |
| <b>Week 5</b> | Cells and tissues (Muscles, epithelial, connective, nervous tissues) |
| <b>Week 6</b> | Blood sampling and venipuncture technique and Complete blood picture |
| <b>Week 7</b> | Final exam                                                           |

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

|                          | Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Available in the Library? |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | <p>1.Lisa A.Michael, L.Cavin ,Steven A. Wasserman .Biology.11<sup>th</sup> edition. 2016</p> <p>2-Jane B. Reece, Steven A. Wasserman , Lisa A.Michael . Campbell. Biology 10<sup>th</sup> Edition.2014</p> <p>3. Abraham L. Kiersenbaum, Laura L. Tres.Histology and cell biology . 4<sup>th</sup> . edition. 2016</p>                                                                                                                                                                                                                                                                                                                                                       |                           |
| <b>Recommended Texts</b> | <p>1-Golgi apparatus and neurodegenerative diseases<br/>Author links open overlay panel<a href="#">JieFanZhipingHuLiuwangZengWeiLuXiangqiTangJieZhangTingLi</a></p> <p>2- Morphometric alterations of Golgi apparatus in Alzheimer's disease are related to tau hyperphosphorylation<br/>Neurobiology of Disease, Volume 97, Part A, 2017, pp. 11-23</p> <p>3- Nerve cell death in degenerative diseases of the central nervous system: clinical aspects.<br/><a href="#">Agid Y</a>, <a href="#">Blin J</a>.</p> <p>4- Functional Architecture of the Cell's Nucleus in Development, Aging, and Disease☆<br/>Author links open overlay panelBrianBurke*Colin L.Stewart†</p> |                           |

|          |  |
|----------|--|
| Websites |  |
|----------|--|

| Grading Scheme<br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                       |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(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<br>(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  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                  |                     |           |                                       |
| <b>Note:</b> 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                       | Freedom and Democracy  |                               | Module Delivery يجب تحديد متطلبات المادة                                                                                                                                                                                                 |
| Module Type                        | Basic                  |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input checked="" type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | UOB104                 |                               |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 2                      |                               |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 50                     |                               |                                                                                                                                                                                                                                          |
| Module Level                       | 1                      | Semester of Delivery          | 1                                                                                                                                                                                                                                        |
| Administering Department           | Biomedical Engineering | College                       | Faculty of Engineering                                                                                                                                                                                                                   |
| Module Leader                      | Jamal Abdul amir Sabre | e-mail                        | 07704500898                                                                                                                                                                                                                              |
| Module Leader's Acad. Title        | مدرس                   | Module Leader's Qualification | اخر شهادة                                                                                                                                                                                                                                |
| Module Tutor                       | د. محمد احمد حمد       | e-mail                        | d mohammed_ahmed@bagdadcollege.edu.iq                                                                                                                                                                                                    |
| Peer Reviewer Name                 | Jamal Abdul amir Sabre | e-mail                        | 07704500898                                                                                                                                                                                                                              |
| Scientific Committee Approval Date | 2025/11                | Version Number                | 1.0                                                                                                                                                                                                                                      |

| Relation with other Modules       |  |          |   |
|-----------------------------------|--|----------|---|
| العلاقة مع المواد الدراسية الأخرى |  |          |   |
| Prerequisite module               |  | Semester | 1 |
| Co-requisites module              |  | Semester | 1 |

| Module Aims, Learning Outcomes and Indicative Contents           |                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية         |                                                                                                                                                                                                                                                                                                                 |
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | 1- التعرف على موضوع حقوق الانسان في الحضارات القديمة والوسيلة والحديثة والمعاصرة.                                                                                                                                                                                                                               |
|                                                                  | 2- التعرف على مفهوم حقوق الانسان ومضمونه وماهية حقوق الانسان                                                                                                                                                                                                                                                    |
|                                                                  | 3- التعرف على الضمانات الدولية لحماية حقوق الانسان ومنها الإعلان العالمي لحقوق الانسان.                                                                                                                                                                                                                         |
|                                                                  | 4- الواجب الوظيفي للمنظمات الدولية ولاسيما منظمة الأمم المتحدة.                                                                                                                                                                                                                                                 |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | المعرفة والفهم<br>1- ان يتعرف الدارس على مدى تأثير حقوق الانسان في مصير البشرية وفي حالة تقييدها.<br>2- معرفة القواعد القانونية التي تضمنتها دساتير العالم وميثاق الأمم المتحدة.<br>3- التعرف على قانون حقوق الانسان والقانون الدولي الإنساني.<br>4- أجيال حقوق الانسان.                                        |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | ج- مهارات التفكير<br>ج1- افهام الدارسين بأهمية وعمل الأقسام والفروع المتعلقة بحقوق الانسان .<br>ج2- اختصار خطوات العمل عن طريق فن التفكير للوصول الى أفضل الخيارات.<br>ج3- تبادل الأفكار المتعلقة بالعمل الجماعي.<br>ج4- ضرورة العمل الاعتراف بقواعد حقوق وجوب تطبيقها في المجتمعات وبعده ذلك من مصاديق التحضر. |

| Learning and Teaching Strategies |                                                                                                                                       |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| استراتيجيات التعلم والتعليم      |                                                                                                                                       |
| <b>Strategies</b>                | 1- تكليف الطلبة للبحث لغرض الإجابة على سؤال مهم بوسيلة الكتاب المفتوح و الاتصال بشخصيات تمتلك الاختصاص بحقوق الانسان.                 |
|                                  | 2- تقسيم المادة بفصول تؤهل الطلب ان التمييز بين الموضوعات المتداخلة في فهم حدود حقوق الانسان.                                         |
|                                  | 3- إيضاح السلبات المتعلقة بسلوك الانسان غير المهتم بحقوق الانسان وإظهار الآثار السلبية الناجمة من الصرف السلبي ضد مبادئ حقوق الانسان. |
|                                  | 4- اختيار أساليب مختلفة للشرح للابتعاد عن طرح الموضوعات المملة.                                                                       |

|  |  |
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| Student Workload (SWL)                                                         |  |                                                                           |  |
|--------------------------------------------------------------------------------|--|---------------------------------------------------------------------------|--|
| الحمل الدراسي للطلاب موزع على (15) اسبوع                                       |  |                                                                           |  |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       |  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       |  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل |  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا |  |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              |  |                                                                           |  |

| Module Evaluation                        |                                        |                                     |                  |                                     |                                                                         |
|------------------------------------------|----------------------------------------|-------------------------------------|------------------|-------------------------------------|-------------------------------------------------------------------------|
| تقييم المادة الدراسية                    |                                        |                                     |                  |                                     |                                                                         |
|                                          |                                        | Time/Number<br>(عدد مرات الامتحان)  | Weight (Marks)   | Week Due<br>(تحديد اسابيع الامتحان) | Relevant Learning Outcome<br>تحديد مواد التعليم التي سيتم الامتحان فيها |
| Formative assessment<br>التقييم التكويني | Quizzes ( امتحان شهري )                |                                     | الوزن (الدرجة)   | الاسبوع                             |                                                                         |
|                                          | Assignments<br>(واجبات)                | واجب بيتي و<br>واجب كلية<br>أسبوعيا |                  | الأسبوع (5، 10، 15)                 | مفهوم حقوق الانسان<br>والتطور التاريخي                                  |
|                                          | Projects / Lab.<br>(مشاريع او مختبرات) | اختبار شفوي شهري                    |                  | الأسبوع (4، 8، 12)                  | تطبيقات حقوق الانسان<br>والديمقراطية                                    |
|                                          | Report (تقارير)                        | تقرير فصلي                          |                  | الأسبوع الثالث                      | مؤسسات حقوق الانسان<br>والديمقراطية                                     |
| Summative assessment<br>التقييم التلخيصي | Midterm Exam<br>(امتحان النصف)         | ساعتان                              |                  |                                     |                                                                         |
|                                          | Final Exam<br>(الامتحان النهائي)       | ثلاث ساعات                          |                  |                                     |                                                                         |
| Total assessment                         |                                        |                                     | 100% (100 Marks) |                                     |                                                                         |

| Module Evaluation     |                 |             |                  |          |                           |
|-----------------------|-----------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |          |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 10% (10)         | 5, 10    | LO #1-4 , LO #5-9         |
|                       | Assignments     | 2           | 20% (10)         | 4, 11    | LO # 1-3 , LO # 4- 10     |
|                       | Projects / Lab. | N/A         |                  |          |                           |
|                       | Report          | 1           | 10% (10)         | 15       | LO # 1-14                 |
| 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                          | الجذور التاريخية لحقوق الانسان                          |
| Week 2                          | التطور الحاصل لفكرة حقوق الانسان                        |
| Week 3                          | إيضاح القوانين الأساسية التي حددت اختصاصات الحكام       |
| Week 4                          | تجسيد قواعد حقوق الانسان في المواثيق                    |
| Week 5                          | امتحان -بيان المضمون                                    |
| Week 6                          | الضمانات الدولية                                        |
| Week 7                          | الضمانات والجمعيات الإقليمية الدولية                    |
| Week 8                          | الضمانات الدولية                                        |
| Week 9                          | مفهوم الديمقراطية                                       |
| Week 10                         | التعريف بالديمقراطية                                    |
| Week 11                         | الجذور التاريخية للديمقراطية                            |
| Week 12                         | تعاقب أنظمة الحكم                                       |
| Week 13                         | التطور في مفهوم الديمقراطية                             |
| Week 14                         | مظاهر الديمقراطية عالمياً                               |
| Week15                          | أنماط الديمقراطية وتطورها في السياقات المعاصرة + مراجعة |
| Week 16                         | الامتحان النهائي                                        |

| <b>Delivery Plan (Weekly Tutorial)</b><br>المنهاج الاسبوعي الاضافي                                                   |                  |
|----------------------------------------------------------------------------------------------------------------------|------------------|
|                                                                                                                      | Material Covered |
| Each week, a question sheet related to the material presented in the theoretical lecture will be solved and debated. |                  |

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |      |                           |
|-----------------------------------------------------------------|------|---------------------------|
|                                                                 | Text | Available in the Library? |
| Required Texts                                                  |      |                           |
| Recommended Texts                                               |      |                           |
| Websites                                                        |      |                           |

| <b>Grading Scheme</b><br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(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<br>(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  |
| <b>Note:</b> 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                       | <b>Physics</b>              |                               | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | <b>Supportive</b>           |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>BME116</b>               |                               |                                                                                                                                                                                                                               |
| ECTS Credits                       | <b>6</b>                    |                               |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | <b>150</b>                  |                               |                                                                                                                                                                                                                               |
| Module Level                       | <b>1</b>                    | Semester of Delivery          |                                                                                                                                                                                                                               |
| Administering Department           | Biomedical Engineering      | College                       | Faculty of Engineering                                                                                                                                                                                                        |
| Module Leader                      | Mohammed Hameed Abdulhassen | e-mail                        | <a href="mailto:m.hameed.hassen97@baghdadcollege.edu.iq">m.hameed.hassen97@baghdadcollege.edu.iq</a>                                                                                                                          |
| Module Leader's Acad. Title        | Assistant Lecturer          | Module Leader's Qualification | M.SC.                                                                                                                                                                                                                         |
| Module Tutor                       | Mohammed Hameed Abdulhassen | e-mail                        | <a href="mailto:m.hameed.hassen97@baghdadcollege.edu.iq">m.hameed.hassen97@baghdadcollege.edu.iq</a>                                                                                                                          |
| Peer Reviewer Name                 | Mohammed Hameed Abdulhassen | e-mail                        | <a href="mailto:m.hameed.hassen97@baghdadcollege.edu.iq">m.hameed.hassen97@baghdadcollege.edu.iq</a>                                                                                                                          |
| Scientific Committee Approval Date | 2025/11/01                  | 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 understand the basic of physics in biomedical engineering such as mechanical, electrical, optics and thermal laws. |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | <ol style="list-style-type: none"> <li>To be able of solving problems through the application of knowledge of physics to biomedical engineering applications.</li> <li>To provide knowledge on different laws used to cover different physical life phenomena.</li> <li>The course deals with the basic of wave theory and electromagnetic radiation.</li> <li>Understanding the theory of electromagnetic waves and sounds.</li> <li>An introduction to the forces and fields through which particles of matter can interact, including electrostatic and magnetic fields.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | <ol style="list-style-type: none"> <li>Understand the basic mechanics. With respect to the motion of one and two dimensions, and the static fluid equations.</li> <li>Understand the basic thermodynamic equations, and their use in the analysis of thermal systems.</li> <li>Understand the mechanical vibration behaviour and the vibration of sound simple theory and applications.</li> <li>Understand the basic electrical forces and energy equations with the electromagnetic general behaviour.</li> <li>Understand the general optics theory and the use of refractive and reflective equations with the simple mirror and optics.</li> <li>Understand general overview for the quantum physics.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | <p>The Indicative content can be divided into five main types listed as follow:</p> <p><b><u>Part A: General Mechanics</u></b></p> <p>The general units used in definition different quantities. The simple mechanical equations used to calculate the motion in both one dimension and two dimensions such as Newton's equation of motion, the fluid in static condition and its pressure. [12 hrs]</p> <p><b><u>Part B: Thermodynamics</u></b></p> <p>What is the thermal system? The definition of temperature and thermal flux. The first and the second thermodynamic law and their applications on thermal system. [6 hrs]</p> <p><b><u>Part C: Vibration and Waves</u></b></p> <p>The vibration waves and propagation. The important properties that effect the wave of the vibrated matters. The sound as a pressure waves transmitted in vibrated media and its related theory. [6 hrs]</p> <p><b><u>Part D: Electricity</u></b></p> <p>The Electrical forces and their fields of effect. The Electrical energy and capacitance phenomena that work on store it. Magnetic field and how to describe and study. [9 hrs]</p> <p><b><u>Part E: Optics</u></b></p> <p>The general optical equations and their method of calculations with respect to the refractive and reflective behaviour of the light with the optics used. [9 hrs]</p> |

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | 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 examples form real life application. |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

#### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

|                                                                                |     |                                                                           |   |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|---|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 48  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 3 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 102 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 150 |                                                                           |   |

### Module Evaluation

#### تقييم المادة الدراسية

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

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

|                          |                                   |
|--------------------------|-----------------------------------|
|                          | <b>Material Covered</b>           |
| <b>Part 1: Mechanics</b> |                                   |
| <b>Week 1</b>            | Units, Trigonometry and vectors.  |
| <b>Week 2</b>            | Motion of one and two dimensions. |
| <b>Week 3</b>            | Newton's Law of Motion.           |

|                                          |                                        |
|------------------------------------------|----------------------------------------|
| <b>Week 4</b>                            | Fluids in statics.                     |
| <b>Part 2: Thermodynamics</b>            |                                        |
| <b>Week 5</b>                            | Thermal analysis and thermal process.  |
| <b>Week 6</b>                            | Laws of thermodynamics.                |
| <b>Week 7</b>                            | Mid – term exam.                       |
| <b>Part 3: Vibrations and waves</b>      |                                        |
| <b>Week 8</b>                            | Vibrations and waves.                  |
| <b>Week 9</b>                            | Sound.                                 |
| <b>Part 4: Electricity and Magnetism</b> |                                        |
| <b>Week 10</b>                           | Electrical forces and fields.          |
| <b>Week 11</b>                           | Electrical energy and capacitance.     |
| <b>Week 12</b>                           | Magnetism                              |
| <b>Part 5: Optics</b>                    |                                        |
| <b>Week 13</b>                           | Reflection and refraction of light     |
| <b>Week 14</b>                           | Mirrors and Lenses                     |
| <b>Week 15</b>                           | Quantum physics.                       |
| <b>Week 16</b>                           | Preparatory week before the final Exam |
|                                          |                                        |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|               | <b>Material Covered</b> |
|---------------|-------------------------|
| <b>Week 1</b> |                         |
| <b>Week 2</b> |                         |
| <b>Week 3</b> |                         |
| <b>Week 4</b> |                         |
| <b>Week 5</b> |                         |
| <b>Week 6</b> |                         |
| <b>Week 7</b> |                         |

### Learning and Teaching Resources

مصادر التعلم والتدريس

|  | <b>Text</b> | <b>Available in the Library?</b> |
|--|-------------|----------------------------------|
|  |             |                                  |

|                          |                                                                                                                                                                                                                                                                                                                                        |                     |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>Required Texts</b>    | <ol style="list-style-type: none"> <li>1. Raymond AS, Chris V, and John H, College Physics, 11<sup>th</sup> edition, Cengage Learning, 2018.</li> <li>2. Medical physics and biomedical engineering, B H Brown, R H Smallwood, D C Barber, P V Lawford and D R Hose, British Library Cataloguing, IOP Publishing Ltd, 1999.</li> </ol> | <p>No</p> <p>No</p> |
| <b>Recommended Texts</b> |                                                                                                                                                                                                                                                                                                                                        |                     |
| <b>Websites</b>          |                                                                                                                                                                                                                                                                                                                                        |                     |

### Grading Scheme

#### مخطط الدرجات

| Group                               | Grade                   | التقدير             | Marks (%) | Definition                            |
|-------------------------------------|-------------------------|---------------------|-----------|---------------------------------------|
| <b>Success Group<br/>(50 - 100)</b> | <b>A</b> - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                     | <b>B</b> - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                     | <b>C</b> - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                     | <b>D</b> - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                     | <b>E</b> - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| <b>Fail Group<br/>(0 – 49)</b>      | <b>FX</b> – Fail        | راسب (قيد المعالجة) | (45-49)   | More work required but credit awarded |
|                                     | <b>F</b> – 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                       | Calculus I             |                               | Module Delivery                                                                                                                                                                                                                          |                                |
| Module Type                        | Core                   |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                |
| Module Code                        | BME113                 |                               |                                                                                                                                                                                                                                          |                                |
| ECTS Credits                       | 6                      |                               |                                                                                                                                                                                                                                          |                                |
| SWL (hr/sem)                       | 150                    |                               |                                                                                                                                                                                                                                          |                                |
| Module Level                       | 1                      | Semester of Delivery          |                                                                                                                                                                                                                                          | 1                              |
| Administering Department           | Biomedical Engineering | College                       | Faculty of Engineering                                                                                                                                                                                                                   |                                |
| Module Leader                      | Karar ali khanjar      |                               | e-mail                                                                                                                                                                                                                                   | karar.96@baghdadcollege.edu.iq |
| Module Leader's Acad. Title        | Assistant Lectured     | Module Leader's Qualification | M.SC                                                                                                                                                                                                                                     |                                |
| Module Tutor                       |                        | e-mail                        |                                                                                                                                                                                                                                          |                                |
| Peer Reviewer Name                 | Karar ali khanjar      | e-mail                        | karar.96@baghdadcollege.edu.iq                                                                                                                                                                                                           |                                |
| Scientific Committee Approval Date | 2025/11/01             | Version Number                | 1                                                                                                                                                                                                                                        |                                |

| Relation with other Modules       |  |          |  |
|-----------------------------------|--|----------|--|
| العلاقة مع المواد الدراسية الأخرى |  |          |  |
| Prerequisite module               |  | Semester |  |
| Co-requisites module              |  | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                     |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                     |
| Module Aims<br>أهداف المادة الدراسية                     | Our Main Goal in this module is to review and Develop the course of mathematics and its applications. Since Functions are the major objects we deal |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                  | with in calculus because they are key to describing the real world in mathematical terms.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <ol style="list-style-type: none"> <li>1. How to Identify the Characteristics of Equations and Sketch their Graphs;</li> <li>2. Find and Graph Equations of Lines Including Parallel and Perpendicular Lines using the concept of slope;</li> <li>3. How to find limits Graphically and Numerically; Evaluate limits analytically;</li> <li>4. Determine One-Sided Limits, Two-Sided Limits and Infinite Limits;</li> <li>5. Find Vertical, Horizontal and Oblique Asymptotes; Determine Continuity at a Point and on an Open Interval;</li> <li>6. Knowledge and Understanding Differentiation which represent One of the Most Important Processes of Calculus;</li> <li>7. Learn new Methods and Rules for Finding Derivatives of Functions Then Apply these Rules to Find Such Things as Velocity, Speed, Acceleration, and the Rates of Change of Two or More related of two or more variables;</li> <li>8. Discuss Several Applications of derivatives of a Function with Three Basic Categories Curve Sketching, Optimization, and Approximation Techniques;</li> <li>9. Knowledge Integration: the Closely Related to Differentiation and Important Process of Calculus;</li> <li>10. Learn New Methods and Rules for Solving Definite and Indefinite Integrals Including the Fundamental Theorem of Calculus, then Apply these Rules to Find such Things as the Position Function for an Object and the Average of a Function;</li> <li>11. Introduce and Define Matrix Which are arrays of real or complex numbers, and have a unique but not exclusive, relationship with systems of linear equations and their solution.</li> </ol> |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <ol style="list-style-type: none"> <li>1 Using the Blackboard and Wide Screen to Introduce the Students to this Module, we also let the students to participate in the problem solving process in the class and by giving them homework;</li> <li>2 Lectures where the students have some printed notes/handouts and may annotate, or expand these during a spoken lecture;</li> <li>3 Personal Videos, Lectures material placed on YouTube or other e-learning environment;</li> <li>4 External Printed lectures or References from industry;</li> <li>5 Obviously, Small group tutorial sessions inside the class make more ideas useful and easier to understand how to solve the Material of this module;</li> <li>6 Question and answer sessions during lectures or staff Office Hours;</li> </ol> |

|  |                                                                                          |
|--|------------------------------------------------------------------------------------------|
|  | 7 Guided reading of texts, journal articles ... etc., for individual and group projects. |
|--|------------------------------------------------------------------------------------------|

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا       |     |                                                                    |     |
|-------------------------------------------------------------------------|-----|--------------------------------------------------------------------|-----|
| Structured SWL (h/sem)<br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 63  | Structured SWL (h/w)<br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4   |
| Unstructured SWL (h/sem)<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 87  | Unstructured SWL (h/w)<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5.5 |
| 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         | 4           | 10 (10%)         | 3,6,10 and 14 | 1-2, 3-4, 7, 9            |
|                                            | Assignments     | 1           | 20(20%)          | 9             | 5                         |
|                                            | Projects / Lab. |             |                  |               |                           |
|                                            | Report          | 1           | 10(10%)          | 13            | 10                        |
| Summative assessment                       | Midterm Exam    | 2           | 10 (10 %)        | 7 and 12      | 6-8, 9-10                 |
|                                            | Final Exam      | 1           | 50 (50 %)        | 15            | 11                        |
| Total assessment                           |                 |             | 100% (100 Marks) |               |                           |

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري |                                                                                                                                 |
|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
|                                                            | Material Covered                                                                                                                |
| Week 1                                                     | Real Numbers and the Real Line, Intervals, and Solving Inequalities such as absolute value, greater integer and sigma function. |
| Week 2                                                     | Solving Quadratic and nonlinear Inequalities.                                                                                   |
| Week 3                                                     | Reviews coordinates, lines, distance, circles, and parabola functions. Also the domain, range and their graphs.                 |
| Week 4                                                     | Summarize number of important types of functions and algebraic Operation on are combined or transformed to form new functions.  |
| Week 5                                                     | reviews the basic Trigonometric functions.                                                                                      |
| Week 6                                                     | Limit: definition and calculating it by using it's laws.                                                                        |

|                |                                                                                            |
|----------------|--------------------------------------------------------------------------------------------|
| <b>Week 7</b>  | Infinite limits, Calculating all types of Asymptotes and Continuity.                       |
| <b>Week 8</b>  | Tangents, Differentiation and it's rules                                                   |
| <b>Week 9</b>  | The derivative as a rate of change and Derivatives of Trigonometric functions.             |
| <b>Week 10</b> | Derivative by using the Chain Rule and Parametric Equations.                               |
| <b>Week 11</b> | The Implicit differentiation and some of the important applications of derivatives.        |
| <b>Week 12</b> | Reviews integral as Area under the curve and The Fundamental theorem of Calculus           |
| <b>Week 13</b> | Indefinite Integrals and the substitution rule also define area between curves by integral |
| <b>Week 14</b> | Matrices and determinants: theorems                                                        |
| <b>Week 15</b> | Inverse Matrix and Solve the System of Equations by using Cramer rule.                     |
| <b>Week 16</b> | Final Exam.                                                                                |

### Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                      | Available in the Library? |
|--------------------------|-----------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | Thomas_Calculus_11 <sup>th</sup> Edition                  | Yes                       |
| <b>Recommended Texts</b> | 1. Calculus-Courses-Adams 2010<br>2. Calculus-Edwards2010 | No                        |
| <b>Websites</b>          |                                                           |                           |

### Grading Scheme

مخطط الدرجات

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