# Unit Description Form

## Course Description Form

## Faculty of Engineering / Department of

| Unit Information | | |
|---|---|---|
| Course Information | | |
| **Unit Title** | **Electric fields** | **Unit delivery** |
| **Unit Type** | **fundamental** | نظريه ⊠ |
| **Unit Code** | **BME-111** | حاضر ⊠ |
| | | المختبر ⊠ |
| **ECTS Credits** | **8** | تعليمي ☐ |
| **SWL (ساعة / SEM)** | **125** | عملي ☐ |
| | | ☐ Seminar |

| | | | |
|---|---|---|---|
| **Unit level** | 2 | **Delivery Semester** | 1 |
| **Department of Administration** | Biomedical Engineering | **College** | Faculty of Engineering |
| **Unit Commander** | Ali Muhammad Abdul sadah Abdul wahid | **E-mail Address** | ali.mohammed@uowa.edu.iq |
| **Title of Unit Commander** | Assistant Lecturer | **Unit Commander Qualifications** | Master |
| **Unit Teacher** | | **E-mail Address** | |
| **Peer Reviewer Name** | name | **E-mail Address** | |
| **Date of accreditation of the Scientific Committee** | 26/9/2024 | **Version number** | 1.0 |

| Relationship with other units | | | |
|---|---|---|---|
| Relationship with other subjects | | | |
| **Prerequisites Unit** | | No | **Semester** | |
| **Common Requirements Unit** | | No | **Semester** | |

| Unit objectives, learning outcomes and how-to contents<br>Course objectives, learning outcomes and instructional contents | |
|---|---|
| **Objectives of the Unit**<br>Course Objectives | Understand the basics of electromagnetic fields: Recognize basic concepts such as electric field, magnetic field, and lines of force.<br>Basic Laws Explained: A Study of Maxwell's Laws, Static Electricity, and Magnetism.<br>Analysis of electromagnetic interactions: interpreting the effect of electric and magnetic fields on moving charges and particles.<br>Applications of electromagnetic fields: such as electromagnetic waves, wireless communications, and measuring devices.<br>. Develop analytical skills: solve problems using differential equations and vectors in the analysis of electromagnetic fields.<br>Linking theory to practice: Understand how electromagnetic principles are used in the design of engineering devices and technological systems. |
| **Unit Learning Outcomes**<br><br>Learning outcomes of the course | Ability to explain the basic concepts of electric and magnetic fields and their relationship to charges and moving particles.<br>Apply Maxwell's laws to understand electromagnetic behavior in different systems.<br>. Analyze electromagnetic interactions using mathematical equations to solve related problems.<br>. Interpret the properties of electromagnetic waves such as propagation, reflection, and refraction in different media.<br>. Link theory to practical applications, such as the design of electromagnetic systems and communication devices.<br>Develop the ability to solve problems using simulation software or customized technical tools. |
| **Indicative Contents**<br>Indicative Contents | Electric fields: Identify electric charges, electric field lines, and calculate field strength using Coulomb's and diving laws.<br>. Magnetic fields: the study of magnetic field lines, bio-savar and ampere laws, and magnetism in materials.<br>. Maxwell's laws: a comprehensive explanation of the four laws and their connection to the behavior of electromagnetic fields.<br>Electromagnetic waves: Wave properties such as speed, wavelength, and frequency, with applications in communications and energy transmission.<br>. Electromagnetic interactions: The effect of fields on moving charges and electric currents.<br>Practical applications: The use of electromagnetic fields in technological devices such as engines, generators, and antennas. |

| Learning and Teaching Strategies<br>Learning and Teaching Strategies | |
|---|---|
| **Strategies** | Learning and Teaching Strategies for the Electromagnetic Fields Unit:<br>The module relies on interactive lectures to explain theoretical concepts and basic laws. Learning is enhanced through hands-on sessions and laboratory experiments to understand the behavior of electromagnetic fields. Simulation software is used to analyze and solve applied problems. It also encourages group discussions and problem solving to develop critical thinking and link theory to practical applications. |

<table>
<tr><td colspan="4" style="text-align:center"><b>Student Workload (SWL)</b><br>The student's academic load is calculated for 15 weeks</td></tr>
<tr><td><b>SWL منظم (h / sem)</b><br>Regular academic load of the student during the semester</td><td>45</td><td><b>SWL regulator(h/s)</b><br>Regular student load per week</td><td>3</td></tr>
<tr><td><b>SWL غير منظم (h / sem)</b><br>Irregular academic load of the student during the semester</td><td>61</td><td><b>Unregulated SWL (h/s)</b><br>Irregular student academic load per week</td><td>4</td></tr>
<tr><td><b>SWL إجمالى (h / sem)</b><br>The student's total academic load during the semester</td><td colspan="3" style="text-align:right">106</td></tr>
</table>

| | | **Unit Evaluation**<br>Course Evaluation | | | |
|---|---|---|---|---|---|
| | **As** | **Time/Number** | **Weight (tags)** | **Week due** | **Related learning outcomes** |
| **Formative Assessment** | **Contests** | 2 | 10% (10) | 5, 10 | LO #1 , 2, 10 and 11 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO #3 , 4, 6 and 7 |
| | **Projects /Laboratory.** | 1 | 10% (10) | continuous | every |
| | **report** | 1 | 10% (10) | 13 | LO #5 , 8 and 10 |
| **Final Assessment** | **Midterm Exam** | 2 hr | 10% (10) | 7 | LO #1-7 |
| | **Final Exam** | 2 hours | 50% (50) | 16 | every |
| | **Overall Rating** | | 100% (100 degree) | | |

| | **Delivery Plan (Weekly Curriculum)**<br>Theoretical Weekly Curriculum |
|---|---|
| **week** | **Covered Material** |
| **Week 2+1** | Electrostatic fields, Coulomb's law and electrical intensity<br>The field resulting from the distribution of a continuous charge in a given volume |
| **Week 4+3** | Electric Flow Density<br>Flow lines, displacement density<br>Gauss's Law |

| | | |
|---|---|---|
| **Week5+6** | | Power and voltage |
| | | Conductors and insulators |
| **Week 8+7** | | Amplitudes and inductors |
| **Week 9+10** | | Study of the magnetic field |
| **Week 12+11** | | Magnetic Forces, Materials, and Inductance |
| **Week 13** | | Electromagnetic fields |

| **Learning and Teaching Resources** | | |
|---|---|---|
| Learning and Teaching Resources | | |
| | **text** | **Available in the library?** |
| **Required texts** | William H. Hayt and Joun A. Buck, "Engineering Elecrtomagnetic". Sadiku, "Elements of Electromagnetic". Joseph A. Edminister, "Electromagnetics | Yes |
| **Recommended texts** | | Yes |
| **Websites** | | |

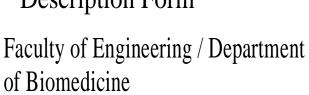| **Grading chart** | | | | |
|---|---|---|---|---|
| Grading chart | | | | |
| group | degree | Appreciation | Tags (%) | definition |
| **An-Najah Group (50 - 100)** | **A -** Excellent | privilege | 90 - 100 | Outstanding Performance |
| | **B -** Very Good | Very good | 80 - 89 | Above average with some errors |
| | **C -** Good | Good | 70 - 79 | Proper work with noticeable errors |
| | **D -** Satisfactory | medium | 60 - 69 | Fair but with significant shortcomings |
| | **E -** sufficient | Acceptable | 50 - 59 | The work meets the minimum standards |
| **Group failure (0 – 49)** | **FX -** Failed | Deposit (in (processing | (45-49) | More work required but credit granted |
| | **F -** Failed | Failure | (0-44) | Large amount of work required |
| | | | | |

**Note:** Signs that are more than 0.5 decimal places greater than or below the full mark will be rounded higher or lower (for example, a score of 54.5 will be rounded to 55, while a mark of 54.4 will be rounded to 54. The university has a policy of not tolerating "imminent traffic failure", so the only modification to the marks granted by the original mark(s) will be the automatic rounding described above.

# Unit Description

## Form Course

## Description Form

## Faculty of Engineering / Department of Biomedicine

| Unit Information | | | | |
|---|---|---|---|---|
| Course Information | | | | |
| **Unit Title** | | Limbs anatomy | **Unit delivery** | |
| **Unit Type** | | basic | ☒ Theory **Lecturer** ☒ **Laboratory** ☒ **Practical** ☐ ☐ Tutorial **Seminar** ☐ | |
| **Unit Code** | | BME-225 | | |
| **ECTS Credits** | | 7 | | |
| **SWL (hr / without)** | | 175 | | |
| **Unit level** | | 4 | **Delivery Semester** | 2 |
| Department of Administration | | Biomedical Engineering | **College** | College of Engineering |
| **Unit Commander** | | Aref Al , Sayyad | **E-mail Address** | aref.alsayad@uowa.edu.iq |
| **Title of Unit Commander** | | Assistant Lecturer | **Unit Commander Qualifications** | Master |
| **Unit Teacher** | | Aref Al , Sayyad | **E-mail Address** | aref.alsayad@uowa.edu.iq |
| **Peer Reviewer Name** | | | **E-mail Address** | |
| **Date of accreditation of the Scientific Committee** | | 01/06/2023 | **Version number** | 1.0 |

| Relationship with other units | | | |
|---|---|---|---|
| Relationship with other subjects | | | |
| **Prerequisites Unit** | No | **Semester** | |
| **Common Requirements Unit** | No | **Semester** | |

| Unit objectives, learning outcomes and how-to contents |
|---|
| Course objectives, learning outcomes and instructional contents |

| | |
|---|---|
| **Objectives of the Unit**<br>Course Objectives | The module aims to provide detailed knowledge about: the skeleton of the upper and lower limbs. The muscles that control the movement of the limbs .<br>Nerves that supply nerve signals to the limbs.<br>Blood vessels that feed the limbs.<br>The unit highlights the relationships between anatomical components and their role in facilitating daily movements and functions. This knowledge helps to:<br>Analysis of clinical conditions associated with the limbs.<br>Dealing with injuries and diseases affecting the limbs. |
| **Unit Learning Outcomes**<br><br>Learning outcomes of the course | Identify the anatomical components of the upper and lower extremities, including bones, muscles, nerves, and blood vessels<br>Explain the functional relationship between the different anatomical components and their role in movement and support .clarify the nerve and vascular pathways of the limbs and understand their effect on normal function,<br>.Analysis of common limb-related injuries and explain their impact on movement and vital functions<br>.Application of anatomical knowledge in the interpretation of relevant clinical cases<br>.Develop critical thinking skills to understand clinical conditions and diagnose periphery-related problems |
| **Indicative Contents**<br>Indicative Contents | 1. Introduction to limb anatomy: includes an overview of the components of the upper and lower limbs and their basic functions 2. Study of the skeleton of the limbs: Analysis of the bones that make up the limbs, including their locations and characteristics 3. Muscle anatomy: recognize the muscles of the limbs, their functions, and mechanisms of movement<br>4. Neural pathways: Explanation of the main nerves that supply the limbs and their motor and sensory functions.5. Blood vessels: identification of the arteries and veins that feed the limbs and their anatomical significance<br>.6 Clinical relationships: linking anatomical information to clinical conditions, such as associated injuries and disorders By the parties. |

| Learning and Teaching Strategies |
|---|
| Learning and Teaching Strategies |

| | |
|---|---|
| **Strategies** | This module is based on a combination of interactive lectures and practical sessions to understand the detailed anatomy of the limbs.  Multimedia, such as three-dimensional models and anatomical images, are used to enhance visual perception. It also encourages group discussions and problem solving for clinical case analysis. Activities conclude with practical applications for skills development<br>.Basic Clinical |

| Student Workload (SWL) | | | |
|---|---|---|---|
| The student's academic load is calculated for 15 weeks | | | |
| **SWL regulator (h/sim)**<br>Regular academic load of the student during the semester | 64 | **Regulator (h / w) SWL**<br>Regular student load per week | 4 |
| **SWL non-regulator (h/sim)**<br>Irregular academic load of the student during the semester | 61 | **Unregulated (h / w) SWL**<br>Irregular student academic load per week | 4 |
| **Total SWL (h/SEM)**<br>The student's total academic load during the semester | | | 125 |

| Unit Evaluation | | | | |
|---|---|---|---|---|
| Course Evaluation | | | | |
| As | Time/Number | Weight (marks) | Week due | Related learning outcomes |
| **Formative Assessment**   Tournament | 2 | 10% (10) | 5, 10 | LO #1 11 , 10 , 2 and |
| Assignments | 2 | 10% (10) | 2, 12 | LO #3 7 , 6 , 4 and |
| .Laboratory / Projects | 1 | 10% (10) | continuous | every |
| report | 1 | 10% (10) | 13 | LO #5, 10 , 8 and |
| **Final Assessment**   Midterm Exam | 2 hr | 10% (10) | 7 | LO #1-7 |
| Final Exam | 2 hours | 50% (50) | 16 | every |
| **Overall Rating** | | Grade (100%100) | | |

| Delivery Plan (Weekly Curriculum) | |
|---|---|
| Theoretical Weekly Curriculum | |
| **week** | **Covered Material** |
| **The week 1+2+3** | The student learns what is anatomy and methods of studying anatomy and medical terminology related to anatomy, and learning the situation |
| **Week 5+4** | The student learns the basic structures of the human body and its functions such as the skin and its accessories, the membran es of the body, muscles and joints,  bone, ligaments, synovial fluid and its accessories, the function of each structure, cartilage, its types, functions and ligaments. |
| **Week 7+6** | Study the devices used in diagnosis, as well as knowing the mechanism of work of each device and its benefits and harms, such as X-ray, MRI, endoscope, device Drop, Sutar |
| **Week 9+8** | The student learns to study the bone of the upper limbs and study their shape and knowledge of their number and location and the functions it performs |
| **The week 11+10** | The student should know the names of the connections, their location, and the functions that they have as well as the origin of the holiday and the club Muscle implant |

| Week 12 | The student learns about the armpit area and its protection, the boundaries that form it, the blood vessels, the lymph nodes circulating in it and the nerves that feed it<br>The student learns the names of nerves<br>And places that face each nerve and the functions it performs |
|---------|---|
| Week 13 | The student learns the lower limbs and the bones below them |
| Week 14 | The student learns a full description of all the bones that are in the lower extremities such as the hip and thigh bones and the functions they perform |
| Week 15 | The student learns a full description of all the bones that are in the lower extremities such as the hip and thigh bones and the functions they perform |

| | Learning and Teaching Resources | |
|---|---|---|
| | Learning and Teaching Resources | |
| | text | Available in the library? |
| **Required texts** | Clinical anatomy of the upper and lower limbs, (10 editions), by Cara Maud, MSPAS, PA-C | Yes |
| **Recommended texts** | | Yes |
| **Websites** | | |

| Grading chart | | | | |
|---|---|---|---|---|
| Grading chart | | | | |
| group | degree | Appreciation | (%) Marks | definition |
| **An-Najah Group (50 - 100)** | Excellent - **A** | privilege | 90 - 100 | Outstanding Performance |
| | Very Good - **B** | Very good | 80 - 89 | Above average with some errors |
| | Good - **C** | Good | 70 - 79 | Proper work with noticeable errors |
| | Satisfactory - **D** | medium | 60 - 69 | Fair but with significant shortcomings |
| | Adequate - **E** | Acceptable | 50 - 59 | The work meets the minimum standards |
| **Group failure (0 − 49)** | **FX** - Failed | Fail (in process) | (45-49) | More work required but credit granted |
| | Failure - **F** | Failure | (0-44) | Large amount of work required |
| | | | | |

Signs that are greater than or less than 0.5 decimal places will be rounded up to the highest or lowest full sign (for example, Note:
, so the only amendment "the university has a policy of not tolerating the 'imminent traffic failure' .The score of 54.5 will be rounded to 55, while the score of 54.4 will be rounded to 54.On the marks granted by the original mark(s) will be the automatic rounding shown above

**Unit Teacher**

**Assistant Lec.Aref Al-Saeed**

# Unit Description Form

# Course Description Form

<table>
<tr><td colspan="5" align="center"><b>Unit Information</b><br><i>Course Information</i></td></tr>
<tr><td align="right"><b>Unit Title</b></td><td colspan="2" align="center"><b>Mathematics II</b></td><td colspan="2" align="right"><b>Unit delivery</b></td></tr>
<tr><td align="right"><b>Unit Type</b></td><td colspan="2" align="center"><b>Basic Learning</b></td><td colspan="2" rowspan="4">☒ <b>Theory</b><br>☒ <b>Roger that</b><br>☐ <b>Lab</b><br>☒ <b>Tutorial</b><br>☐ <b>practical</b><br>☐ <b>Seminar</b></td></tr>
<tr><td align="right"><b>Unit Code</b></td><td colspan="2" align="center">ENG102</td></tr>
<tr><td align="right"><b>ECTS Credits</b></td><td colspan="2" align="center">6</td></tr>
<tr><td align="right"><b>SWL (Hour /SEM)</b></td><td colspan="2" align="center">051</td></tr>
<tr><td colspan="2" align="right"><b>Unit level</b></td><td align="right">4</td><td align="center"><b>Delivery Semester</b></td><td align="right">2</td></tr>
<tr><td colspan="2" align="right"><b>Administrative Management</b></td><td align="right">Biomedical</td><td align="center"><b>College</b></td><td align="center"><b>Engineering Faculty</b></td></tr>
<tr><td align="right"><b>Unit Commander</b></td><td colspan="2" align="center"><b>Eng. Hassan Allawi Sabbar</b></td><td align="right"><b>E-mail Address</b></td><td align="center">Hassan.as@uowa.edu.iq</td></tr>
<tr><td colspan="2" align="center"><b>Title of Unit Commander</b></td><td align="center"><b>Assistant Lecturer</b></td><td align="center"><b>Unit Commander Qualifications</b></td><td align="right">Master</td></tr>
<tr><td align="center"><b>Unit Teacher</b></td><td colspan="2"></td><td align="center"><b>E-mail Address</b></td><td></td></tr>
<tr><td colspan="2" align="center"><b>Peer Reviewer Name</b></td><td align="right">name</td><td align="center"><b>E-mail Address</b></td><td align="right">E-mail Address</td></tr>
<tr><td colspan="2" align="center"><b>Date of accreditation of the Scientific Committee</b></td><td align="center">1/6/2023</td><td align="center"><b>Version number</b></td><td align="right">1.0</td></tr>
</table>

<table>
<tr><td colspan="4" align="center"><b>Relationship with other units</b><br><i>Relationship with other subjects</i></td></tr>
<tr><td align="right"><b>Prerequisites Unit</b></td><td align="center">Mathematics I</td><td align="center"><b>Semester</b></td><td align="right">1</td></tr>
<tr><td align="right"><b>Common Requirements Unit</b></td><td align="right">Any</td><td align="center"><b>Semester</b></td><td></td></tr>
</table>

| Unit objectives, learning outcomes and how-to contents | |
|---|---|
| Course objectives, learning outcomes and instructional contents | |
| **Objectives of the Unit** <br> Course Objectives | The Mathematics module aims to provide students with an understanding of mathematical concepts, skills and techniques that can be applied to a range of real-world problems. This course aims to introduce the concepts of calculus, complex numbers, vectors and linear algebra. In addition, the module aims to prepare students for future academic and career endeavors that require athletic competence. |
| **Unit Learning Outcomes** <br><br> Learning outcomes of the course | By the end of this module, the student should be able to: <br><br> 1. Use asymptotic, first and second derivatives to plot graph functions. <br> 2. Apply advanced integration rules/techniques to calculate integrals. Drawing graphs of functions; rounding jobs. <br> 3. Description of the polar coordinate system. <br> 4. Convert from rectangular to polar coordinates. <br> 5. Apply matrix techniques and elementary theory to the problem in geometry. <br> 6. Solve the systems of linear equations and find the inverse of the matrix. <br> 7. Perform the basic algebra of vectors. <br> 8. Evaluate the dot product and vector of two vectors. <br> 9. Evaluate the gradient and spacing and curling of different numerical and vector fields. <br><br> 10. Complex numbers: algebra of complex numbers, solution of complex polynomial equations, Argand diagrams, polar form of complex numbers, exponential form of complex numbers, sequential expansion of trigonometric and exponential functions, de Moivre's theorem. |
| **Indicative Contents** <br> Indicative Contents | The instructional contents of the Mathematics module depend on the level and scope of the course. However, some common topics that can be covered in the Mathematics module include: <br> 1. Arithmetic: Basic arithmetic operations such as addition, subtraction, multiplication, and division. <br> 2. Algebra: the study of mathematical symbols and the rules for manipulating these symbols to solve equations and represent real-world situations. <br> 3. Geometry: The study of shapes, volumes, positions and measurements of objects in space. <br> 4. Calculus: The study of mathematical concepts such as limits, derivatives, and integrals. <br> In general, the instructional contents of the Mathematics module are intended to provide students with a comprehensive understanding of mathematical concepts and their applications in various fields of study. |

| Learning and Teaching Strategies | |
|---|---|
| **Learning and Teaching Strategies** | |
| **Strategies** | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time improving and expanding their critical thinking skills. This will be achieved through interactive classrooms and tutorials and consideration of the kind of simple experiments involving some sampling activities of interest to students. |

| Student Workload (SWL) | | | |
|---|---|---|---|
| Student Load | | | |
| **SWL regulator (h/sem)** Regular academic load of the student during the semester | 78 | **SWL regulator(h/s)** Regular student load per week | 6 |
| **Unregulated SWL (h/sem)** Irregular academic load of the student during the semester | 72 | **Unregulated SWL (h/s)** Irregular student academic load per week | 4 |
| **Total SWL(h/sem)** The student's total academic load during the semester | | | 150 |

| Unit Evaluation | | | | | |
|---|---|---|---|---|---|
| Course Evaluation | | | | | |
| | **As** | **Time/Number** | **Weight (tags)** | **Week due** | **Related learning outcomes** |
| **Formative Assessment** | **Contests** | 2 | 10% (10) | 5, 10 | LO #1 , 2, 10 and 11 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO #3 , 4, 6 and 7 |
| | **Projects/Laboratory.** | 1 | 10% (10) | continuous | |
| | **report** | 1 | 10% (10) | 13 | LO #5 , 8 and 10 |
| **Final Assessment** | **Midterm Exam** | 2 hours | 10% (10) | 7 | LO #1-7 |
| | **Final Exam** | 3hr | 50% (50) | 16 | every |
| | **Overall Rating** | | 100% (100 degree) | | |

| week | Delivery Plan (Weekly Curriculum)<br>Theoretical Weekly Curriculum |
|---|---|
| | **Covered Material** |
| Week 1<br>Week 2<br>Week 3 | **Transcendental functions:** inverse functions and their derivatives, natural logarithms, exponential functions, indefinite forms and L'Hôpital rule, inverse trigonometric functions, hyperbolic functions and their inverse. |
| Week 4<br>Week 5 | **Integration techniques:** integration by parts, trigonometric integrals, trigonometric alternatives, partial fractions, incorrect integrals. |
| Week 6 | **Polar coordinates:** Polar coordinate system, graphing polar coordinate equations, areas and lengths in polar coordinates |
| Week 7<br>Week 8<br>Week 9 | **Matrices and determinants**: definitions, properties and operations, determinant, matrix inverse, solving equations of linear system, eigenvalues and eigenvectors**.** |
| week 10<br>week 11<br>week 12 | **Vector theory:** three-dimensional coordinate systems, vector representation in space, unit vectors, scalar product, vector product, lines and planes in space, vector function. |
| Week 13<br>Week 14<br>Week 15 | **Complex numbers:** complex numbers and operations, solving quadratic equations, Argand diagram, polar form of a complex number, Demoivre's theorem. |
| Week 16 | Preparatory week before the final exam |

| | Learning and Teaching Resources<br>Learning and Teaching Resources | |
|---|---|---|
| | **text** | **Available in the library?** |
| **Required texts** | George B. Thomas Jr., "Calculus," 14th Ed | Yes |
| **Recommended texts** | 1. Erwin Kreszig, "Advanced Engineering Mathematics", tenth edition.<br>2. Shum Chart of University Mathematics, fourth edition.<br>3. Mary Attenborough, "Mathematics for Electrical and Computing Engineering", 1st Ed. | No |
| **Websites** | Topics in Calculus - Wolfram Mathworld. | |

| group | degree | Appreciation | Tags (%) | definition |
|---|---|---|---|---|
| **An-Najah Group (50 - 100)** | **A** - Excellent | privilege | 90 - 100 | Outstanding Performance |
| | **B** - Very Good | Very good | 80 - 89 | Above average with some errors |
| | **C** - Good | Good | 70 - 79 | Proper work with noticeable errors |
| | **D** - Satisfactory | medium | 60 - 69 | Fair but with significant shortcomings |
| | **E** - sufficient | Acceptable | 50 - 59 | The work meets the minimum standards |
| **Group failure (0 – 49)** | **FX** - Failed | Deposit (in processing) | (45-49) | More work required but credit granted |
| | **F** - Failed | Failure | (0-44) | Large amount of work required |
| | | | | |

**Note:** Signs that are more than 0.5 decimal places greater than or below the full mark will be rounded higher or lower (for example, a score of 54.5 will be rounded to 55, while a mark of 54.4 will be rounded to 54. The university has a policy of not tolerating "imminent traffic failure", so the only modification to the marks granted by the original mark(s) will be the automatic rounding described above.

# Unit Description Form

## Course Description Form

## Faculty of Engineering / Department of

<table>
<tr><td colspan="4" align="center"><strong>Unit Information</strong><br>Course Information</td></tr>
<tr><td align="right"><strong>Unit Title</strong></td><td colspan="2" align="center"><strong style="color:red">Computer Science</strong></td><td align="right"><strong>Unit delivery</strong></td></tr>
<tr><td align="right"><strong>Unit Type</strong></td><td colspan="2" align="center"><strong>secondary</strong></td><td rowspan="4">نظريه ☒<br>حاضر ☒<br>المختبر ☒<br>تعليمي ☐<br>عملي ☐<br>☐ Seminar</td></tr>
<tr><td align="right"><strong>Unit Code</strong></td><td colspan="2" align="center"><strong style="color:red">BME-12-04</strong></td></tr>
<tr><td align="right"><strong>ECTS Credits</strong></td><td colspan="2" align="center"><strong>8</strong></td></tr>
<tr><td align="right"><strong>SWL (ساعة / SEM)</strong></td><td colspan="2" align="center"><strong style="color:red">75</strong></td></tr>
<tr><td align="right"><strong>Unit level</strong></td><td>2</td><td align="right"><strong>Delivery Semester</strong></td><td>2</td></tr>
<tr><td align="right"><strong>Department of Administration</strong></td><td>Biomedical Engineering</td><td align="right"><strong>College</strong></td><td>Faculty of Engineering</td></tr>
<tr><td align="right"><strong>Unit Commander</strong></td><td>Fares Karim Haliwat</td><td align="right"><strong>E-mail Address</strong></td><td>Faris.kar@uowa.edu.iq</td></tr>
<tr><td align="right"><strong>Title of Unit Commander</strong></td><td>Assistant Lecturer</td><td align="right"><strong>Unit Commander Qualifications</strong></td><td>Master</td></tr>
<tr><td align="right"><strong>Unit Teacher</strong></td><td></td><td align="right"><strong>E-mail Address</strong></td><td></td></tr>
<tr><td align="right"><strong>Peer Reviewer Name</strong></td><td></td><td align="right"><strong>E-mail Address</strong></td><td>E-mail Address</td></tr>
<tr><td align="right"><strong>Date of accreditation of the Scientific Committee</strong></td><td>26/9/2024</td><td align="right"><strong>Version number</strong></td><td>1.0</td></tr>
</table>

<table>
<tr><td colspan="4" align="center"><strong>Relationship with other units</strong><br>Relationship with other subjects</td></tr>
<tr><td align="right"><strong>Prerequisites Unit</strong></td><td>No</td><td align="right"><strong>Semester</strong></td><td></td></tr>
<tr><td align="right"><strong>Common Requirements Unit</strong></td><td>No</td><td align="right"><strong>Semester</strong></td><td></td></tr>
</table>

| | **Unit objectives, learning outcomes and how-to contents**<br>Course objectives, learning outcomes and instructional contents | |
|---|---|---|
| **Objectives of the Unit**<br>Course Objectives | 1. **Teaching the basics of programming**: Understand basic concepts such as variables, conditional statements, and loops.<br>2. **Proficiency in programming languages**: Enable students to write programs using languages such as C and C++.<br>3. **Algorithm Design**: Develop the ability to design effective algorithms to solve software problems.<br>4. **Understanding data structures**: Learn how to use different data structures such as arrays and lists.<br>5. **Application of object-oriented programming (OOP):** Teaching object-oriented programming principles such as objects and classes.<br>6. **Teaching debugging techniques**: improving debugging and code analysis skills.<br>7. **Apply advanced programming concepts**: Enable students to use advanced programming libraries and frameworks. | |
| **Unit Learning Outcomes**<br><br>Learning outcomes of the course | Understand programming principles: Gain knowledge of programming basics such as variables, conditional statements, and loops.<br>Proficiency in programming languages: Ability to write programs using languages such as C and C++.<br>Algorithm Design: Develop skills to design and implement effective problem-solving algorithms.<br>Use data structures: Effectively apply data structures such as arrays, lists, and trees.<br>Object-oriented programming (OOP): Understand and apply object-oriented programming principles such as objects and classes.<br>Error analysis and correction: Develop debugging skills and improve code.<br>Apply advanced concepts: the use of software libraries and frameworks, and the programming of multi-threaded applications.<br>1. | |
| **Indicative Contents**<br>Indicative Contents | 1. Basic programming concepts: Learn the basics of programming such as variables, graphic types, and conditional structures.<br>2. C/C++ Programming: Learn C or C++ as an application development tool.<br>3. Algorithms: The study of how algorithms are designed and implemented to solve software problems.<br>4. Data structures: Learn how to use structures such as threaded lists, arrays, trees.<br>5. Object-oriented programming (OOP): Learn the principles of object-oriented programming such as objects and classes.<br>6. Debugging: Techniques for finding and correcting errors in code.<br>7. Advanced concepts: Learn programming using libraries and frameworks, and programming multi-threaded applications. | |

| **Learning and Teaching Strategies**<br>Learning and Teaching Strategies |
|---|

| Strategies | 1. Active Learning: Encourage students to actively participate by solving exercises and problems themselves, enhancing their understanding of mathematical concepts. |
|---|---|
| | 2. Collaborative learning: teamwork to solve mathematical problems, helping to exchange ideas and develop analytical skills. |
| | 3. Project-based learning: Using applied mathematical projects that link mathematics to everyday life, such as studying statistics or engineering designs. |
| | 4. Ongoing Assessment: Conduct regular quizzes and exercises to track students' progress and identify points that need to be strengthened. |
| | 5. Interpretation and Discussion: Encourage students to explain their solutions and ways of thinking to stimulate deep understanding and improve communication skills. |

## Student Workload (SWL)
### The student's academic load is calculated for 15 weeks

| SWL منظم (h / sem) Regular academic load of the student during the semester | 35 | SWL regulator(h/s) Regular student load per week | 5 |
|---|---|---|---|
| SWL غير منظم (h / sem) Irregular academic load of the student during the semester | 35 | Unregulated SWL (h/s) Irregular student academic load per week | 5 |
| SWL إجمالى (h / sem) The student's total academic load during the semester | | | 75 |

## Unit Evaluation
### Course Evaluation

| | As | Time/Number | Weight (tags) | Week due | Related learning outcomes |
|---|---|---|---|---|---|
| Formative Assessment | Contests | 2 | 10% (10) | 5, 10 | LO #1 , 2, 10 and 11 |
| | Assignments | 2 | 10% (10) | 2, 12 | LO #3 , 4, 6 and 7 |
| | Projects /Laboratory. | 1 | 10% (10) | continuous | every |
| | report | 1 | 10% (10) | 13 | LO #5 , 8 and 10 |
| Final Assessment | Midterm Exam | 2 hr | 10% (10) | 7 | LO #1-7 |
| | Final Exam | 2 hours | 50% (50) | 16 | every |
| | Overall Rating | 100% (100 degree) | | | |

| Grading chart | | | | |
|---|---|---|---|---|
| Grading chart | | | | |
| group | degree | Appreciation | Tags (%) | definition |
| **An-Najah Group (50 - 100)** | **A -** Excellent | privilege | 90 - 100 | Outstanding Performance |
| | **B -** Very Good | Very good | 80 - 89 | Above average with some errors |
| | **C -** Good | Good | 70 - 79 | Proper work with noticeable errors |
| | **D -** Satisfactory | medium | 60 - 69 | Fair but with significant shortcomings |
| | **E -** sufficient | Acceptable | 50 - 59 | The work meets the minimum standards |
| **Group failure (0 – 49)** | **FX -** Failed | Deposit (in (processing | (45-49) | More work required but credit granted |
| | **F -** Failed | Failure | (0-44) | Large amount of work required |
| | | | | |

**Note:** Signs that are more than 0.5 decimal places greater than or below the full mark will be rounded higher or lower (for example, a score of 54.5 will be rounded to 55, while a mark of 54.4 will be rounded to 54. The university has a policy of not tolerating "imminent traffic failure", so the only modification to the marks granted by the original mark(s) will be the automatic rounding described above.

# Unit Description Form

## Course Description Form

## Faculty of Engineering / Department of

| Unit Information | | |
|---|---|---|
| Course Information | | |
| **Unit Title** | **Computer Programming** | **Unit delivery** |
| **Unit Type** | **Secoundray** | ⊠ نظريه<br>⊠ حاضر<br>⊠ المختبر<br>☐ تعليمي<br>☐ عملي<br>☐ Seminar |
| **Unit Code** | BME-12-04 | |
| **ECTS Credits** | **8** | |
| **SWL (ساعة / SEM)** | **75** | |

| | | | |
|---|---|---|---|
| **Unit level** | 1 | **Delivery Semester** | 2 |
| **Administrative Management** | UGx11 1 | **College** | BME - 111 |
| **Unit Commander** | Ali abd alhussain | **E-mail Address** | Ali.abdalhussain@uowa.edu.iq |
| **Title of Unit Commander** | Assistant Lecturer | **Unit Commander Qualifications** | Master |
| **Unit Teacher** | | **E-mail Address** | |
| **Peer Reviewer Name** | | **E-mail Address** | E-mail Address |
| **Date of accreditation of the Scientific Committee** | 26/9/2024 | **Version number** | 1.0 |

| Relationship with other units | | | |
|---|---|---|---|
| Relationship with other subjects | | | |
| **Prerequisites Unit** | | No | **Semester** | |
| **Common Requirements Unit** | | No | **Semester** | |

| | **Unit objectives, learning outcomes and how-to contents**<br>Course objectives, learning outcomes and instructional contents | |
|---|---|---|
| **Objectives of the Unit**<br>Course Objectives | 1. **Teaching the basics of programming**: Understand basic concepts such as variables, conditional statements, and loops.<br>2. **Proficiency in programming languages**: Enable students to write programs using languages such as C and C++.<br>3. **Algorithm Design**: Develop the ability to design effective algorithms to solve software problems.<br>4. **Understanding data structures**: Learn how to use different data structures such as arrays and lists.<br>5. **Application of object-oriented programming (OOP):** Teaching object-oriented programming principles such as objects and classes.<br>6. **Teaching debugging techniques**: improving debugging and code analysis skills.<br>7. **Apply advanced programming concepts**: Enable students to use advanced programming libraries and frameworks. | |
| **Unit Learning Outcomes**<br><br>Learning outcomes of the course | Understand programming principles: Gain knowledge of programming basics such as variables, conditional statements, and loops.<br>Proficiency in programming languages: Ability to write programs using languages such as C and C++.<br>Algorithm Design: Develop skills to design and implement effective problem-solving algorithms.<br>Use data structures: Effectively apply data structures such as arrays, lists, and trees.<br>Object-oriented programming (OOP): Understand and apply object-oriented programming principles such as objects and classes.<br>Error analysis and correction: Develop debugging skills and improve code.<br>Apply advanced concepts: the use of software libraries and frameworks, and the programming of multi-threaded applications.<br>1. | |
| **Indicative Contents**<br>Indicative Contents | 1. Basic programming concepts: Learn the basics of programming such as variables, graphic types, and conditional structures.<br>2. C/C++ Programming: Learn C or C++ as an application development tool.<br>3. Algorithms: The study of how algorithms are designed and implemented to solve software problems.<br>4. Data structures: Learn how to use structures such as threaded lists, arrays, trees.<br>5. Object-oriented programming (OOP): Learn the principles of object-oriented programming such as objects and classes.<br>6. Debugging: Techniques for finding and correcting errors in code.<br>7. Advanced concepts: Learn programming using libraries and frameworks, and programming multi-threaded applications. | |

| **Learning and Teaching Strategies**<br>Learning and Teaching Strategies |
|---|

| | | |
|---|---|---|
| **Strategies** | 1. Active Learning: Encourage students to actively participate by solving exercises and problems themselves, enhancing their understanding of mathematical concepts.<br>2. Collaborative learning: teamwork to solve mathematical problems, helping to exchange ideas and develop analytical skills.<br>3. Project-based learning: Using applied mathematical projects that link mathematics to everyday life, such as studying statistics or engineering designs.<br>4. Ongoing Assessment: Conduct regular quizzes and exercises to track students' progress and identify points that need to be strengthened.<br>5. Interpretation and Discussion: Encourage students to explain their solutions and ways of thinking to stimulate deep understanding and improve communication skills. | |

| **Student Workload (SWL)** | | | | |
|---|---|---|---|---|
| The student's academic load is calculated for 15 weeks | | | | |
| **(h / sem) منظم SWL**<br>Regular academic load of the student during the semester | 35 | **SWL regulator(h/s)**<br>Regular student load per week | 5 | |
| **(h / sem) غير منظم SWL**<br>Irregular academic load of the student during the semester | 35 | **Unregulated SWL (h/s)**<br>Irregular student academic load per week | 5 | |
| **SWL (h / sem) إجمالى**<br>The student's total academic load during the semester | | | 75 | |

| **Unit Evaluation** | | | | | |
|---|---|---|---|---|---|
| Course Evaluation | | | | | |
| | **As** | **Time/Number** | **Weight (tags)** | **Week due** | **Related learning outcomes** |
| **Formative Assessment** | **Contests** | 2 | 10% (10) | 5, 10 | LO #1 , 2, 10 and 11 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO #3 , 4, 6 and 7 |
| | **Projects /Laboratory.** | 1 | 10% (10) | continuous | every |
| | **report** | 1 | 10% (10) | 13 | LO #5 , 8 and 10 |
| **Final Assessment** | **Midterm Exam** | 2 hr | 10% (10) | 7 | LO #1-7 |
| | **Final Exam** | 2 hours | 50% (50) | 16 | every |
| | **Overall Rating** | 100% (100 degree) | | | |

| | | | | **Grading chart** |
| | | | | Grading chart |
| group | degree | Appreciation | Tags (%) | definition |
|---|---|---|---|---|
| **An-Najah Group (50 - 100)** | **A -** Excellent | privilege | 90 - 100 | Outstanding Performance |
| | **B -** Very Good | Very good | 80 - 89 | Above average with some errors |
| | **C -** Good | Good | 70 - 79 | Proper work with noticeable errors |
| | **D -** Satisfactory | medium | 60 - 69 | Fair but with significant shortcomings |
| | **E -** sufficient | Acceptable | 50 - 59 | The work meets the minimum standards |
| **Group failure (0 – 49)** | **FX -** Failed | Deposit (in (processing | (45-49) | More work required but credit granted |
| | **F -** Failed | Failure | (0-44) | Large amount of work required |
| | | | | |

**Note:** Signs that are more than 0.5 decimal places greater than or below the full mark will be rounded higher or lower (for example, a score of 54.5 will be rounded to 55, while a mark of 54.4 will be rounded to 54. The university has a policy of not tolerating "imminent traffic failure", so the only modification to the marks granted by the original mark(s) will be the automatic rounding described above.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

<table>
<tr><td colspan="5" align="center"><b>Module Information</b><br>معلومات المادة الدراسية</td></tr>
<tr><td><b>Module Title</b></td><td colspan="2" align="center"><b>Cell Biology</b></td><td><b>Module Delivery</b></td><td></td></tr>
<tr><td><b>Module Type</b></td><td colspan="2" align="center"><b>Basic</b></td><td colspan="2" rowspan="4">☒ Theory<br>☒ Lecture<br>☒ Lab<br>☐ Tutorial<br>☐ Practical<br>☐ Seminar</td></tr>
<tr><td><b>Module Code</b></td><td colspan="2" align="center"><b>BME-212</b></td></tr>
<tr><td><b>ECTS Credits</b></td><td colspan="2" align="center"><b>4</b></td></tr>
<tr><td><b>SWL (hr/sem)</b></td><td colspan="2" align="center"><b>100</b></td></tr>
<tr><td><b>Module Level</b></td><td colspan="2">2</td><td><b>Semester of Delivery</b></td><td>1</td></tr>
<tr><td><b>Administering Department</b></td><td colspan="2">Type Dept. Code</td><td><b>College</b></td><td>engineering</td></tr>
<tr><td><b>Module Leader</b></td><td colspan="2">Aref alsayad</td><td><b>e-mail</b></td><td>aref.alsayad@uowa.edu.iq</td></tr>
<tr><td><b>Module Leader's Acad. Title</b></td><td colspan="2"></td><td><b>Module Leader's Qualification</b></td><td>Ph.D.</td></tr>
<tr><td><b>Module Tutor</b></td><td colspan="2">Name (if available)</td><td><b>e-mail</b></td><td></td></tr>
<tr><td><b>Peer Reviewer Name</b></td><td colspan="2">Name</td><td><b>e-mail</b></td><td>E-mail</td></tr>
<tr><td><b>Scientific Committee Approval Date</b></td><td colspan="2">01/06/2023</td><td><b>Version Number</b></td><td>1.0</td></tr>
</table>

<table>
<tr><td colspan="4" align="center"><b>Relation with other Modules</b><br>العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td><b>Prerequisite module</b></td><td>None</td><td><b>Semester</b></td><td></td></tr>
<tr><td><b>Co-requisites module</b></td><td>None</td><td><b>Semester</b></td><td></td></tr>
</table>

| Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims** أهداف المادة الدراسية | 1. To know the cell number, size, shape, and properties of cells and distinguish their characteristics. <br> 2. To understand Chromosomes and Genes, Structure of a Chromosome <br> 3. This course deals with the basic concept of Muscle tissue. <br> 4. This is the basic subject for all body tissues. <br> 5. To develop skills Dealing Structure of the Cell and Cell Organelles. <br> 6. To Know the types of microscopes used in diagnosis. |
| **Module Learning Outcomes** مخرجات التعلم للمادة الدراسية | 1. Recognize all types of body tissues. <br> 2. Summarize What is Structure of the Cell and Cell Organelles. <br> 3. Learn about the function of cartilage in the body. <br> 4. Discuss the most important tissues that cover the skeletal system <br> 5. Discuss the characteristics of tissues in the reproductive system <br> 6. Explain what Chromosomes and Genes <br> 7. Describe the importance of the tissues of the respiratory system <br> 8. Discuss the most important dyes used in diagnosis <br> 9. Description of the immunohistochemistry technique <br> 10. Electron microscopy and its importance in histological diagnosis were discussed |
| **Indicative Contents** المحتويات الإرشادية | Indicative content includes the following. <br><br> Cell Division (Mitosis and Miosis) , Prophase, Metaphase, Anaphase, Telophase , Reduction or Maturation Division (Meiosis)  [12 hrs] <br><br> cartilage, hyaline, elastic and fibrocatilage, histogensis of cartilage ,Bone- cells, matrix, types of bones, bone histogenesis ,blood, cells, formed elements, hematopoiesis, stem cells, bone marrow, maturation of erythrocytes, maturation of granyolocytes, maturation of lymphocytes and monocytes, origin of platelets [12 hrs] <br><br> Genetics (The Science of Heredity) Genes, Chromosomes, and the Genome , The Allele , Dominance, Recessiveness, and Codominance , Phenotype and Genotype , The Mendelian Rules , Autosomal Dominant Hereditary Transmission , Sex-linked Inheritance. [12 hrs] <br><br> Exchange of Materials between the Cell and Its Environment Composition of the , Extracellular Fluid , Composition of the Intracellular Fluid , Membrane or Resting Potential of a Cel , Solid and Fluid TransportRenal system  , reproductive systems. [20 hrs] |

| Learning and Teaching Strategies | |
|---|---|
| استراتيجيات التعلم والتعليم | |
| **Strategies** | The main strategy that will be adopted in delivering this module is to encourage students' Structure of the Cell and Cell Organelles and laboratory technique, This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. |

| Student Workload (SWL) | | | |
|---|---|---|---|
| الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا | | | |
| **Structured SWL (h/sem)** الحمل الدراسي المنتظم للطالب خلال الفصل | 48 | **Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا | 4 |
| **Unstructured SWL (h/sem)** الحمل الدراسي غير المنتظم للطالب خلال الفصل | 52 | **Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4 |
| **Total SWL (h/sem)** الحمل الدراسي الكلي للطالب خلال الفصل | 100 | | |

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

| Delivery Plan (Weekly Syllabus) |
|---|
| المنهاج الاسبوعي النظري |

| | Material Covered |
|---|---|
| Week 1 | Introduction of cell Number, Size, Shape, and Properties of Cells , Metabolism and the Generation of Energy , Reproduction and Life Expectancy , Sensitivity to Stimulation and Response to Stimulation |
| Week 2 | Structure of the Cell and Cell Organelles , Cell Membrane , Cytoplasm and Cell Organelles, Endoplasmic Reticulum (ER) , Ribosomes, Golgi Apparatus |
| Week 3 | Lysosomes , Centrioles , Mitochondria , The Cell Nucleus |
| Week 4 | Chromosomes and Genes, Structure of a Chromosome , The Genetic Code , Protein Synthesis , Duplication of Genetic Material (Replication) |
| Week 5 | Cell Division (Mitosis and Miosis) , Prophase, Metaphase, Anaphase, Telophase , Reduction or Maturation Division (Meiosis) |
| Week 6 | First maturation division , Second maturation division , The result of the two maturation divisions = mature sex cells , Prophase II , Metaphase II , Anaphase II , Telophase II |
| Week 7 | Mid-term Exam |
| Week 8 | Exchange of Materials between the Cell and Its Environment Composition of the , Extracellular Fluid , Composition of the Intracellular Fluid , Membrane or Resting Potential of a Cel , Solid and Fluid Transport |
| Week 9 | Diffusion , Osmosis and Osmotic Pressure , Filtration , Active Transport , Endocytosis and Exocytosis |
| Week 10 | Genetics (The Science of Heredity) Genes, Chromosomes, and the Genome , The Allele , Dominance, Recessiveness, and Codominance , Phenotype and Genotype , The Mendelian Rules , Autosomal Dominant Hereditary Transmission , Sex-linked Inheritance |
| Week 11 | X Chromosome-linked Dominant Inheritance , X Chromosome-linked Recessive Inheritance , Mutations , Gene Mutations , Chromosome Mutations , Genome Mutations |
| Week 12 | Epithelial Tissue and connective tissue , Surface Epithelia , Cell Junctions , Glandular and Sensory Epithelia , Simple epithelial tissue , Stratified tissue , Shape of epithelial tissue , Connective tissue Function , Connective Tissue Cells |
| Week 13 | Intercellular Matrix (Ground Substance) , Loose Areolar (Interstitial) Tissue , Dense Fibrous White Connective Tissue , Adipose (Fatty) Tissue , Cartilaginous Tissue , Bone Tissue |
| Week 14 | Nervous and Muscles tissue , Smooth Muscle Tissue , Striated Muscle Tissue , Cardiac Muscle Tissue |
| Week 15 | The Neuron , The Nerve Impulse (Action Potential) , The Synapse , The Glia Cells (Neuroglia) |
| Week 16 | **Preparatory week before the final Exam** |

| Learning and Teaching Resources | | |
|---|---|---|
| مصادر التعلم والتدريس | | |
| | **Text** | **Available in the Library?** |
| **Required Texts** | Cytology (7<sup>th</sup> editions) by Silva Anderus A L (ed.). | Yes |
| **Recommended Texts** | Human Biology (6<sup>th</sup> editions), by John Recharged | yes |
| **Websites** | https://libgen.me/book/ed0b6954e2617c88bdd0e1a8d335eaf7 | |

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

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

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information معلومات المادة الدراسية | | | |
|---|---|---|---|
| **Module Title** | **Information Technology** | **Module Delivery** | |
| **Module Type** | Secondary | ☒ **Theory** | |
| **Module Code** | WBM-21-04 | ☒ **Lecture** | |
| **ECTS Credits** | 8 | ☒ **Lab** | |
| **SWL (hr/sem)** | 125 | ☐ **Tutorial**<br>☐ **Practical**<br>☐ **Seminar** | |
| **Module Level** | 1 | **Semester of Delivery** | 1 |
| **Administering Department** | BME. | **College** | ENG. |
| **Module Leader** | Ali Abdul-Hussein Mohammed | **e-mail** | ali.masaoodi@uowa.edu.iq |
| **Module Leader's Acad. Title** | Assistant Lecturer | **Module Leader's Qualification** | M.S.c |
| **Module Tutor** | Ali Abdul-Hussein Mohammed | **e-mail** | ali.masaoodi@uowa.edu.iq |
| **Peer Reviewer Name** | Non | **e-mail** | … |
| **Scientific Committee Approval Date** | 2025/9/16 | **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 | |
| **Module Aims**<br>أهداف المادة الدراسية | The aims of this module are to introduce students to the foundational principles and practices of IT in contemporary society. The course enables learners to understand essential components such as computer hardware, software, data processing, networking, cybersecurity, programming, cloud computing, and bioinformatics. The module also emphasizes the ethical, social, and global implications of IT. It aims to develop students' analytical, technical, and problem-solving skills, preparing them to apply IT effectively in academic, personal, and professional contexts. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | By the end of this module, students will be able to:<br><br>1. Understand the key concepts of IT including hardware, software, networking, and databases.<br>2. Apply programming and algorithmic thinking to solve basic problems.<br>3. Demonstrate knowledge of cybersecurity threats and solutions.<br>4. Utilize multimedia tools and data formats for digital content processing.<br>5. Explore cloud computing and internet-based applications.<br>6. Understand bioinformatics fundamentals and data retrieval techniques.<br>7. Analyze ethical and social issues associated with information technology.<br>8. Develop practical skills in using modern IT tools and platforms. |
| **Indicative Contents**<br>المحتويات الإرشادية | 1. Introduction to IT and its impact in various sectors<br><br>2. Computer hardware and software fundamentals<br><br>3. Data representation, storage, and processing<br><br>4. Multimedia technologies: text, audio, image, video, animation<br><br>5. Networking, internet, and cloud computing<br><br>6. Cybersecurity principles and global data protection<br><br>7. Algorithmic thinking and programming basics<br><br>8. Database concepts and file management<br><br>9. Internet applications, APIs, and cloud services<br><br>10. Bioinformatics: biological data formats, analysis, and tools |

## Learning and Teaching Strategies
### استراتيجيات التعلم والتعليم

| Strategies | The main strategy that will be adopted in the delivery of this module by encouraging students to participate in discussions, while improving and expanding their critical thinking skills. This will be achieved through discussions during the weekly lectures and after the oral presentations by answering the questions of their colleagues. Enhancing the principle of teamwork by participating in the implementation of the laboratory Assignments and developing the student skills in programming using Python by implementing challenged project assignments. |
|---|---|

## Student Workload (SWL)
### الحمل الدراسي للطالب

| Structured SWL (h/sem)<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 64 | Structured SWL (h/w)<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 4 |
|---|---|---|---|
| Unstructured SWL (h/sem)<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 61 | Unstructured SWL (h/w)<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4 |
| Total SWL (h/sem)<br>الحمل الدراسي الكلي للطالب خلال الفصل | 125 | | |

## Module Evaluation
### تقييم المادة الدراسية

| | | Time/ Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| Formative assessment | Quizzes | 2 | 10% (10) | 4,10 | LO #1,2,3,4 and 9 |
| | Project Assignment | 1 | 10% (10) | 12 | All |
| | Lab. Assignment | 1 | 10% (10) | Continuous | All |
| | Seminar | 1 | 10% (10) | The student chooses the week and the topics | All |
| Summative assessment | Midterm Exam | 2hr | 10% (10) | 7 | LO # 1-9 |
| | Final Exam | 3hr | 50% (50) | 16 | All |
| Total assessment | | | 100% (100 Marks) | | |

| Delivery Plan (Weekly Syllabus) |
|---|
| المنهاج الاسبوعي النظري |

| | Material Covered |
|---|---|
| **Week 1** | **Introduction to Information Technology:**<br><br>• Definition and scope of IT in the digital age<br>• History and evolution of computing and IT systems<br>• Types of computers: microcomputers, mainframes, supercomputers, mobile devices<br>• IT in education, healthcare, government, and business<br>• The digital divide: global inequality in access and usage<br>• Social, cultural, and economic impacts of IT |
| **Week 2** | **Computer Hardware and Software:**<br><br>• Components of a computer system: input, output, storage, processing<br>• Brief introduction on CPU architecture, control unit, ALU, registers<br>• RAM, ROM, and cache memory<br>• Storage technologies: HDDs, SSDs, flash memory, optical storage |
| **Week 3** | • System vs application software<br>• File types, formats, and extensions<br>• Operating system basics: process management, user interfaces, multitasking |
| **Week 4** | **Data Representation and Processing**<br><br>• Number systems: binary, decimal, hexadecimal<br>• Character encoding standards: ASCII, Unicode<br>• Binary representation of Image, audio, and video. Data compression: lossless vs. lossy<br>• Data integrity and error checking<br>• Input-process-output (IPO) model, Data types and data formats |
| **Week 5** | **Multimedia: Video, Audio & Animation**<br><br>• Text encoding, UTF-8, plain text, richtext, hypertext, text compression, text as UI element, glyphs, TrueType (TTF), font rendering, anti-aliasing, text editors.<br>• Digital audio, sampling rate, quantization, bit depth, compression (MP3, WAV), audio processing (trimming, effects, mixing)<br>• Digital images and graphics, resolution, bit depth, Bitmaps (JPEG, PNG, GIF), image compression, vector graphics (SVG, AI), color model RGB,<br>• Video principles, frames, formats, editing, compression, encoding, 2D animation. |
| **Week 6** | **Networking, Internet, and Cloud Computing**<br>• Network types: LAN, WAN, MAN, PAN<br>• Network topologies: star, bus, ring, mesh<br>• Communication protocols: TCP/IP, HTTP, FTP<br>• IP addressing, DNS, MAC addresses<br>• Internet architecture and services: WWW, email, VoIP, DNS<br>• Cloud computing: SaaS, PaaS, IaaS<br>• Multimedia delivery over the internet: streaming protocols, buffering, latency |

| Week 7 | **Midterm Exam** |
|---|---|
| **Week 8** | **Cybersecurity Introduction**<br><br>• Cyber threats: malware, ransomware, phishing, DoS/DDoS attacks<br>• Encryption and authentication methods<br>• Password management and two-factor authentication<br>• Ethical issues: data privacy, surveillance, algorithmic bias<br>• Intellectual property, copyright, software piracy<br>• Digital forensics and cybercrime law<br>• GDPR and global data protection regulations |
| **Week 9** | **Algorithms Principles**<br><br>• Problem decomposition and abstraction<br>• Algorithm design principles<br>• Flowcharting symbols, Pseudocode and structured logic<br>• Sorting and searching algorithms<br>• Complexity: time and space considerations |
| **Week 10** | **Programming Fundamentals**<br><br>• Introduction to programming languages<br>• Data types, variables, and expressions<br>• Brief introduction into control structures: if-else, loops, switch-case<br>• Functions, procedures, and modular programming<br>• Arrays and data collections<br>• GUI vs command-line applications<br>• IDEs and version control systems (Git) |
| **Week 11** | **Database & File Management**<br><br>• Concepts of databases: tables, fields, records, keys<br>• Database models: relational, hierarchical, object-oriented<br>• SQL fundamentals: SELECT, INSERT, UPDATE, DELETE, JOIN<br>• Data validation and integrity<br>• File organization: sequential, indexed, hashed<br>• Flat files vs. relational databases<br>• Biological Databases and Data Retrieval, overview of biological databases |
| **Week 12** | **Internet Applications and Cloud Services**<br><br>• Static vs. dynamic web pages<br>• Front-end frameworks,<br>• Role of the back end: APIs, databases, authentication<br>• RESTful APIs and HTTP methods<br>• Introduction to back-end frameworks, Intro to XML and JSON |
| **Week 13** | • Introduction for cloud computing, cloud benefits<br>• Characteristics: on-demand, scalability, multitenancy, elasticity<br>• Service models<br>• Cloud providers: AWS, Azure, GCP overview |

| | |
|---|---|
| | • Internet of Things (IoT) and Cloud Integration<br>• Data collection and streaming<br>• Real-time analytics and dashboards<br>• Smart devices and cloud-based control |
| **Week 14** | **Bioinformatics & Computational Biology**<br><br>• Central dogma of molecular biology<br>• DNA, RNA, protein structures and sequences<br>• Biological databases: NCBI, GenBank, UniProt, PDB<br>• Sequence retrieval and data formats (FASTA, GFF)<br>• Comparative genomics and genome browsers<br>• Sequence annotation and metadata |
| **Week 15** | • DNA sequence manipulation with Python<br>• Protein translation & reading frames, translate DNA/RNA sequences into proteins and explore different reading frames.<br>• Fundamentals of sequence alignment<br>• Building basic bioinformatics workflows: integrating python and conceptual tools for simple data analysis and visualization. |
| **Week 16** | Preparatory week before the final Exam |

## Learning and Teaching Resources
### مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Brian K. Williams_ Stacey C. Sawyer - Using information technology, a practical introduction to computers communications | Yes |
| **Recommended Texts** | Wang, Xinkun. Next-generation sequencing data analysis. CRC Press, 2023. | No |
| **Recommended Websites** | | |

## Grading Scheme
### مخطط الدرجات

| Group | Grade | التقدير | Marks (%) | Definition |
|---|---|---|---|---|
| **Success Group** | **A** - Excellent | امتياز | 90 - 100 | Outstanding Performance |

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

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

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information | | |
|---|---|---|
| معلومات المادة الدراسية | | |
| **Module Title** | **Engineering Mechanics** | **Module Delivery** |
| **Module Type** | **Core** | ☒Theory |
| **Module Code** | BME-213 | ☒Lecture |
| **ECTS Credits** | **5** | ☐Lab |
| | | ☐Tutorial |
| **SWL (hr/sem)** | **125** | ☐Practical |
| | | ☐Seminar |

| **Module Level** | 3 | **Semester of Delivery** | 3 |
|---|---|---|---|
| **Administering Department** | Type Dept. Code | **College** | Type College Code |
| **Module Leader** | **Assist. lect. Hussein Ameer Aljawad** | **e-mail** | Salah.mahdi@uokerbala.edu.iq |
| **Module Leader's Acad. Title** | **Assist. lect** | **Module Leader's Qualification** | MSc |
| **Module Tutor** | Name (if available) | **e-mail** | E-mail |
| **Peer Reviewer Name** | Name | **e-mail** | E-mail |
| **Scientific Committee Approval Date** | | **Version Number** | |

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

1

| Module Aims, Learning Outcomes and Indicative Contents | |
|---|---|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
| **Module Aims**<br>أهداف المادة الدراسية | Building and preparing the student psychologically to play his role as an engineer |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Motivate the student to be creative and think about specialization projects and keep developing with the current development in the engineering mechanics |
| **Indicative Contents**<br>المحتويات الإرشادية | Motivate the student to be creative and think about specialization projects and keep developing with the current development in the engineering mechanics |

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

| Student Workload (SWL) | | | |
|---|---|---|---|
| الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 109 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 7 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 91 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 200 | | |

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

| Delivery Plan (Weekly Syllabus) | |
|---|---|
| المنهاج الاسبوعي النظري | |
| | Material Covered |
| Week 1 | Introduction to Dynamics |
| Week 2 | Rectilinear Motion |
| Week 3 | Plane Curvilinear Motion |
| Week 4 | Normal and Tangent coordinates ( n-t ) |
| Week 5 | Polar Coordinates (r-$\theta$) |
| Week 6 | Relative Motion |
| Week 7 | MID Exam 1 |
| Week 8 | Constrained Motion of Connected Particles |
| Week 9 | Work and Energy |
| Week 10 | Potential Energy |
| Week 11 | Impact |
| Week 12 | Impulse-Momentum |
| Week 13 | Conservation of Energy and Momentum |
| Week 14 | Steady Mass Flow |
| Week 15 | MID Exam 2 |
| Week 16 | Preparatory week before the final Exam |

| Learning and Teaching Resources | | |
|---|---|---|
| مصادر التعلم والتدريس | | |
| | **Text** | **Available in the Library?** |
| **Required Texts** | ENGINEERING MECHANICS: DYNAMICS, (5th editions), by J. L. MERIAM and L. G. KRAIGE. | No |
| **Recommended Texts** | Engineering Mechanics: Dynamics, (14th edition, by R. C. Hibbeler | No |
| **Websites** | https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering | |

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

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

# MODULE DESCRIPTION FORM

| Module Information | | |
|---|---|---|
| **Module Title** | **Materials Science** | **Module Delivery** |
| **Module Type** | B | ☒ Theory |
| **Module Code** | **BME-214** | ☒ Lecture |
| **ECTS Credits** | **4** | ☒ Lab |
| **SWL (hr/sem)** | **100** | ☐ Tutorial |
| | | ☐ Practical |
| | | ☐ Seminar |

| | | | |
|---|---|---|---|
| **Module Level** | 1 | **Semester of Delivery** | 1 |
| **Administering Department** | Biomedecal | **College** | Engineering |
| **Module Leader** | Hasan Allawi | **e-mail** | Hassan.as@uowa.edu.iq |
| **Module Leader's Acad. Title** | Assist lecture | **Module Leader's Qualification** | Msc |
| **Module Tutor** | Name (if available) | **e-mail** | E-mail |
| **Peer Reviewer Name** | Name | **e-mail** | E-mail |
| **Scientific Committee Approval Date** | 01/06/2023 | **Version Number** | 1.0 |

| Relation with other Modules | | |
|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| | Module Aims, Learning Outcomes and Indicative Contents |
|---|---|
| **Module Aims** | 1. Identify engineering materials, especially biological materials, that are in contact with the body of a living organism.<br>2. Identify the types of bonding between atoms of matter<br>3. Identify space lattice of metals<br>4. Calculations related with space lattice of metals<br>5. Mechanical properties of materials<br>6. Polymers: its types, properties and applications<br>7. Ceramics: its types, properties and applications<br>8. Composite materials. |
| **Module Learning Outcomes** | 1. Training the student on the purposeful engineering mindset<br>2. Make the student able to distinguish between engineering materials and their uses.<br>3. Applying theoretical concepts through conducting practical experiments on the properties of matter.<br>4. Recognize and understand how to choose the right material in the right place.<br>5. The ability to analyze and discover the problem or error and the ability to find a solution to the error. |
| **Indicative Contents** | Indicative content includes the following.<br><br>-**Introduction into materials science**<br><br>Materials Science and Engineering.<br><br>Why Study Materials Science?<br><br>Classification of Materials<br><br>Primary and secondary bonds.<br><br>Atomic Structure<br><br>Number of atoms<br><br>Atomic Bonding in Solids<br><br>Types of bonds in materials<br><br>Types of atomic and molecular bonds<br><br>Metal-crystal network.<br><br>Atomic or Ionic Arrangements<br><br>Crystal Structures of metals<br><br>The Face-Centered Cubic (FCC) Crystal Structure<br><br>The Body-Centered Cubic Crystal Structure (B.C.C).<br><br>The Hexagonal Close-Packed Crystal Structure (HCP). |

| | Density Computations—metals |
|---|---|
| | Single Crystals |
| | Polycrystalline Materials |
| | Nanocrystalline Solids (Amorphous) (16hrs) |
| | - **Introduction into Mechanical behavior** |
| | Tensile testing |
| | Engineering Stress-Strain Curve |
| | Shear testing |
| | Hardness |
| | Fatigue test |
| | Some problems (8hrs) |
| | - **Introduction into Polymer** |
| | Fundamentals of Polymer Science and Technology |
| | Importance of polymers |
| | Polymerization |
| | Degree of Polymerization and Molecular Weight |
| | Linear, Branched, and Cross-Linked Polymers |
| | Network Polymers |
| | Copolymers |
| | Arrangements of polymer unite (mers) |
| | Crystallinity |
| | Polymer Crystals |
| | Plastics (12hrs) |
| | - **Introduction into Ceramics** |
| | Classification of ceramic materials |
| | Properties of ceramics: |
| | Structures of Crystalline Ceramics |
| | Types of ceramics |
| | A-Traditional Ceramics |
| | B-New Ceramics |
| | Glass |
| | Methods of producing ceramics: |
| | Bio ceramics |
| | Examples for Bio ceramics (12hrs) |
| | - **Introduction into Composites materials** |

| | Technology and Classification of |
|---|---|
| | Composite Materials |
| | Metal Matrix Composites |
| | Ceramic Matrix Composites |
| | Polymer Matrix Composites (8hrs) |

## Learning and Teaching Strategies

| Strategies | 1.Giving lectures and solving mathematical problems, if any, on the board.<br>2. Use of modern technologies and display videos and practical means of electronic display (Data Show) to illustrate the shapes and drawings and diagrams and vocabulary lecture.<br>3. Focusing on students' participation in the lecture by asking questions, eliciting new ideas and finding other ways to solve mathematical problems.<br>4- Adopting the homework method to solve the exercises by the students and evaluating their solutions in the classroom. |
|---|---|

## Student Workload (SWL)

| Structured SWL (h/sem) | 63 | Structured SWL (h/w) | 4 |
|---|---|---|---|
| Unstructured SWL (h/sem) | 37 | Unstructured SWL (h/w) | 2.5 |
| Total SWL (h/sem) | 100 | | |

## Module Evaluation

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

## Delivery Plan (Weekly Syllabus)

| | Material Covered |
|---|---|
| Week 1 | Introduction into materials science<br><br>Materials Science and Engineering.<br><br>Why Study Materials Science?<br><br>Classification of Materials |
| Week 2 | Primary and secondary bonds.<br><br>Atomic Structure<br><br>Number of atoms<br><br>Atomic Bonding in Solids<br><br>Types of bonds in materials<br><br>Types of atomic and molecular bonds |
| Week 3 | Metal-crystal network.<br><br>Atomic or Ionic Arrangements<br><br>Crystal Structures of metals<br><br>The Face-Centered Cubic (FCC) Crystal Structure<br><br>The Body-Centered Cubic Crystal Structure (B.C.C). |
| Week 4 | The Hexagonal Close-Packed Crystal Structure (HCP).<br><br>Density Computations—metals<br><br>Single Crystals<br><br>Polycrystalline Materials<br><br>Nanocrystalline Solids (Amorphous) |
| Week 5 | Introduction into Mechanical behavior |

| | |
|---|---|
| | Tensile testing<br><br>Engineering Stress-Strain Curve<br><br>Shear testing |
| **Week 6** | Hardness<br><br>Fatigue test<br><br>Some problems |
| **Week 7** | Mid-term Exam |
| **Week 8** | Introduction into Polymer<br><br>Fundamentals of Polymer Science and Technology<br><br>Importance of polymers<br><br>Polymerization |
| **Week 9** | Degree of Polymerization and Molecular Weight<br><br>Linear, Branched, and Cross-Linked Polymers<br><br>Network Polymers<br><br>Copolymers |
| **Week 10** | Arrangements of polymer unite (mers)<br><br>Crystallinity<br><br>Polymer Crystals<br><br>Plastics |
| **Week 11** | Introduction into Ceramics<br><br>Classification of ceramic materials<br><br>Properties of ceramics: |
| **Week 12** | Structures of Crystalline Ceramics<br><br>Types of ceramics<br><br>A-Traditional Ceramics<br><br>B-New Ceramics |
| **Week 13** | Glass<br><br>Methods of producing ceramics:<br><br>Bio ceramics<br><br>Examples for Bio ceramics |
| **Week 14** | Introduction into Composites materials<br><br>Technology and Classification of |

| | |
|---|---|
| | Composite Materials |
| **Week 15** | Metal Matrix Composites |
| | Ceramic Matrix Composites |
| | Polymer Matrix Composites |
| **Week 16** | **Preparatory week before the final Exam** |

## Delivery Plan (Weekly Lab. Syllabus)

| | Material Covered |
|---|---|
| **Week 1** | Lab 1: Sample Preparation for Microscopic Inspection |
| **Week 2** | Lab 2: Microscopic Inspection for specimen |
| **Week 3** | Lab 3: Tensile Test |
| **Week 4** | Lab 4: Hardness Test |
| **Week 5** | Lab 5: Fatigue test |
| **Week 6** | Lab 6: Impact Test |
| **Week 7** | Lab 7: Properties of Engineering Materials with Regular Shapes <br><br> -Bulk density <br><br> - Specific weight: <br><br> - The porosity |

## Learning and Teaching Resources

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | 1-    (Engineering metallurgy, part 1) Higgins, Raymond A.- Engineering Metallurgy - Applied Physical Metallurgy- Elsevier (1993). <br> 2-    (Engineering metallurgy, part 2) Higgins, Raymond A.- Engineering Metallurgy - Applied Physical Metallurgy- Elsevier (1993). | No |
| **Recommended Texts** | 1-The Science and Engineering of Materials, Seventh Edition, Donald R. Askeland, University of | No |

| | Missouri—Rolla, Emeritus, Wendelin J. Wright, Bucknell Univers, 2016. 2-Materials Science and Engineering An Introduction, William D. Callister, Jr. and David G. Rethwisch, 2010 | |
|---|---|---|
| **Websites** | /https://www.sanfoundry.com | |

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

<table>
<tr><td colspan="4" align="center"><strong>Module Information</strong></td></tr>
<tr><td><strong>Module Title</strong></td><td align="center"><strong><span style="color:red">Electronic</span></strong></td><td colspan="2"><strong>Module Delivery</strong></td></tr>
<tr><td><strong>Module Type</strong></td><td align="center"><strong>Core</strong></td><td colspan="2" rowspan="4">☒Theory<br>☒Lecture<br>☒Lab<br>☒Tutorial<br>☒Practical<br>☐Seminar</td></tr>
<tr><td><strong>Module Code</strong></td><td align="center"><strong><span style="color:red">BBE-211</span></strong></td></tr>
<tr><td><strong>ECTS Credits</strong></td><td align="center"><strong>7</strong></td></tr>
<tr><td><strong>SWL (hr/sem)</strong></td><td align="center"><strong><span style="color:red">175</span></strong></td></tr>
<tr><td><strong>Module Level</strong></td><td>1</td><td><strong>Semester of Delivery</strong></td><td>1</td></tr>
<tr><td><strong>Administering Department</strong></td><td>Biomedical engineering</td><td><strong>College</strong></td><td>College of engineering</td></tr>
<tr><td><strong>Module Leader</strong></td><td>Ali Mohammed</td><td><strong>e-mail</strong></td><td>Ali.mohammed@uowa.edu.iq</td></tr>
<tr><td><strong>Module Leader's Acad. Title</strong></td><td>Assistant Teacher</td><td><strong>Module Leader's Qualification</strong></td><td>Ph.D.</td></tr>
<tr><td><strong>Module Tutor</strong></td><td>Ali Mohammed</td><td><strong>e-mail</strong></td><td>E-mail</td></tr>
<tr><td><strong>Peer Reviewer Name</strong></td><td>Name</td><td><strong>e-mail</strong></td><td>E-mail</td></tr>
<tr><td><strong>Scientific Committee Approval Date</strong></td><td>01/06/2023</td><td><strong>Version Number</strong></td><td>1.0</td></tr>
</table>

<table>
<tr><td colspan="4" align="center"><strong>Relation with other Modules</strong></td></tr>
<tr><td><strong>Prerequisite module</strong></td><td>None</td><td><strong>Semester</strong></td><td></td></tr>
<tr><td><strong>Co-requisites module</strong></td><td>None</td><td><strong>Semester</strong></td><td></td></tr>
</table>

**Module Aims, Learning Outcomes and Indicative Contents**

| | |
|---|---|
| **Module Aims** | 1. To develop problem solving skills and understanding of electronic circuit through the application of techniques.<br>2. To understand diode circuits analysis and application.<br>3. To understand clipper, clamper and zener diode circuits.<br>4. This course deals with the basic concept of electronic circuits.<br>5. To understand the main types of transistor and analyzing them.<br>6. To perform an analysis for cascaded connection of transistor. |
| **Module Learning Outcomes** | 1. Recognize how electronic elements works in electronic circuits.<br>2. List the various terms associated with electronic circuits.<br>3. Summarize what is meant by a basic electronic circuit.<br>4. Describe the different types of diode and transistor.<br>5. Identify the basic electronic elements and their applications.<br>6. Learn about the practical applications of diode in terms of wave cutting and wave modification.<br>7. Learn about Zener diode, its properties and composition<br>8. Learn about the bipolar Junction Transistor, its structure and working principle. |
| **Indicative Contents** | Indicative content includes the following.<br><br>Semiconductor: N-type, P-type, P-N junction, V-I characteristics, Diode Applications, half-wave rectifier, full-wave rectifier, power supply with filters and regulators, clippers, clampers, Zener Diode: construction, characteristics and circuits, applications, Other Types of Diodes: Varactor diodes, current regulator diode, tunnel diode, schottky diode, PIN diode, Bipolar Junction Transistor(BJT): transistor structure, BJT connection configuration, biasing, characteristics, amplification parameters, D.C. load line, Q-point and waveform distortion, BJT switch operation, BJT amplifier operation, H-Parameters, equivalent circuits for C.C., C.B. and C.E. with its circuit's applications. |

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

## Student Workload (SWL)

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)** | 109 | **Structured SWL (h/w)** | 7 |
| **Unstructured SWL (h/sem)** | 91 | **Unstructured SWL (h/w)** | 6 |
| **Total SWL (h/sem)** | 200 | | |

## Module Evaluation

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

## Delivery Plan (Weekly Syllabus)

| | Material Covered |
|---|---|
| **Week 1** | Semiconductor: N-type, P-type, P-N junction, V-I characteristics, |
| **Week 2** | Diode Applications, half-wave rectifier, fullwave rectifier, |
| **Week 3** | parameters, D.C. load line, Q-point and waveform distortion |
| **Week 4** | power supply with filters and regulators, clippers, clampers, |
| **Week 5** | Zener Diode:construction, characteristics and circuits, applications, |
| **Week 6** | Bipolar Junction Transistor(BJT): transistor structure, |

| Week 7 | Mid-term Exam |
|---|---|
| Week 8 | BJT connection configuration, biasing, characteristics,amplification |
| Week 9 | BJT switch operation, |
| Week 10 | BJT amplifier operation, |
| Week 11 | H-Parameters, equivalent circuits |
| Week 12 | H-Parameters, equivalent circuits for C.C. |
| Week 13 | H-Parameters, equivalent circuits for C.B. |
| Week 14 | H-Parameters, equivalent circuits C.E. with its circuit's applications. |
| Week 15 | Darlington's amplifier |
| Week 16 | **Preparatory week before the final Exam** |

## Delivery Plan (Weekly Lab. Syllabus)

| | Material Covered |
|---|---|
| Week 1 | Lab 1: Diode characterstics |
| Week 2 | Lab 2: Rectifiers and  filters |
| Week 3 | Lab 3: Clippers, clampers and voltage amplifiers |
| Week 4 | Lab 4: Zener diode as voltage regulator |
| Week 5 | Lab 5: BJT characteristics and DC Biasing |
| Week 6 | Lab 6: common Emitter Amplifier |
| Week 7 | Lab 7: common Collector Amplifier |

## Learning and Teaching Resources

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Boylestad, R.L., and Nashelsky, L., Electronic Devices and circuit Theory, 9th Ed., Pearson Education, Inc., 2013. | Yes |
| **Recommended Texts** | Floyd, Thomas L., Electronic devices: Electron Flow Version, 11th Ed., Pearson Education, Inc., 2012. | No |

| Grading Scheme | | | |
|---|---|---|---|
| **Group** | **Grade** | **Marks (%)** | **Definition** |
| **Success Group (50 - 100)** | **A -** Excellent | 90 - 100 | Outstanding Performance |
| | **B -** Very Good | 80 - 89 | Above average with some errors |
| | **C -** Good | 70 - 79 | Sound work with notable errors |
| | **D -** Satisfactory | 60 - 69 | Fair but with major shortcomings |
| | **E -** Sufficient | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX –** Fail | (45-49) | More work required but credit awarded |
| | **F –** Fail | (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.

# Course Description Form

| 1. Course Name: |
|---|
| Electronic II |

| 2. Course Code: |
|---|
| WBM-22-07 |

| 3. Semester / Year: |
|---|
| Semester |

| 4. Description Preparation Date: |
|---|
| 2024-03-19 |

| 5. Available Attendance Forms: |
|---|
| presence in the classroom |

| 6. Number of Credit Hours (Total) / Number of Units (Total) |
|---|
| 105 Hours / 7 Units |

| 7. Course administrator's name (mention all, if more than one name) |
|---|
| Name: Ali Mohammed<br>Email: ali.mohammed@uowa.edu.iq |

## 8. Course Objectives

| Course Objectives | **The study of electronics aims to identify and understand all basic electronic components by understanding their internal structure and the materials from which they are made. This will help students understand how to work with them, their functions, how to connect them, and the practical applications in which these components can be utilized. Students will also understand the mathematical equations and relationships specific to each electronic component by thoroughly analyzing the component and providing an appropriate description. Students will also explore these components in the laboratory and observe their behavior.** |
|---|---|

## 9. Teaching and Learning Strategies

| **Strategy** | 1- Enabling the student to demonstrate a tr[...] understanding of electronic components during t[...] academic phase.<br>2- Understand the rules and foundations upon whi[...] each electronic component is built.<br>3- Learn and understand the methods of connecti[...] electronic components together to perform vario[...] tasks.<br>4- Learn about the applications of electronics and [...] importance in practical life.<br>5- Understand the mathematical ratios a[...] relationships for each electronic component. |
|---|---|

## 10. Course Structure

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

| | | | | | |
|---|---|---|---|---|---|
| 1 +2+3 | 4 | JFET Transistor | Chemical structure of transistor, types, properties, mathematical equations, examples, practical applications | Lectures presented PDF format | Daily exams + homework assignments + monthly exams |
| 4+5 | 4 | MOSFET Transistor | Chemical structure of transistor, its types, properties, mathematic equations, examples, practical applications | Lectures presented in PDF format | Daily exams homework assignments monthly exam |
| 6+7 | 4 | AC analysis | AC analysis with transistors | Lectures presented in PDF format | Daily exams homework assignments monthly exam |
| 8+9+10 | 4 | Transistor responses | The response of each type of transistor to frequencies and the differences between them. | Lectures presented in PDF format | Daily exams homework assignments monthly exam |
| 10 +11+12 | 4 | Multistage transistor | Analysis of circuits containing more than one transistor | Lectures presented in PDF format | Daily exams homework assignments monthly |
| 13+14+15 | 4 | Integrated circuits | Introduction to integrated circuits, their components, and how they work | Lectures presented in PDF format | Daily exams homework assignments monthly |

## 11.Course Evaluation

⬚ Daily exams with practical and scientific questions.
⬚ Participation scores for difficult competition questions among students
⬚ Establishing grades for environmental duties and the reports assigned to them
⬚ Semester exams for the curriculum, in addition to the mid-year exam and final exam

## 12.Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | Boylestad, R.L., and Nashelsky, L., Electronic Devices circuit Theory, 9th Ed., Pearson Education, Inc., 2013. |
| Main references (sources) | • College library to obtain addition sources for the academic curricula<br>• Check scientific websites to see rece developments in the subject |

| Recommended books and references (scientific journals, reports...) | All reputable scientific journals that a related to the broad concept mathematical theories and their resu |
|---|---|

# Model Unit Description
## Subject Description Form
## Faculty of Engineering / Department of Biomedicine

## Unit information
### Subject information

| | | |
|---|---|---|
| **Unit Title** | **English language** | **Unit delivery** |
| **Unit Type** | **Support** | ☒theory |
| **unity symbol** | BME-12-04 | ☒present<br>☐The laboratory |
| **ECTS Credits** | **8** | ☒Educational |
| **SWL (hour/SEM)** | **30** | ☐practical<br>☒The seminar |

| | | | |
|---|---|---|---|
| **Unit level** | 1 | **Semester for delivery** | 2 |
| **Administration Department** | Biomedical | **The college** | College of Engineering |
| **Unit Commander** | Saad Mahmoud | **e-mail** | saad.mah@uowa.edu.iq |
| **Unit Commander Title** | Assistant Doctor | **Unit Commander Qualifications** | PhD |
| **Unit teacher** | | **e-mail** | |
| **Peer Reviewer Name** | name | **e-mail** | e-mail |
| **Scientific Committee Approval Date** | 26/5/2025 | **issue number** | 1.0 |

## Relationship with other units
### Relationship with other subjects

| | | | |
|---|---|---|---|
| **Prerequisites Unit** | nothing | **Semester** | |
| **Common Requirements Unit** | nothing | **Semester** | |

1

| Unit objectives, learning outcomes and guiding content<br>Course objectives, learning outcomes and guiding content | |
|---|---|
| **Unit objectives**<br>Subject objectives | English language study aims to improve global communication skills and enhance career and academic opportunities. Teaching strategies include blended learning, interactive learning, and technology-based learning. Academic outcomes include language proficiency, the ability to read and interpret scientific research, and the ability to interact effectively in multicultural environments. |
| **Unit learning outcomes**<br><br>Learning outcomes for the subject | 1. Master fundamental skills, including reading, writing, listening, and speaking.<br>2. Critical and creative thinking: Cultivate the ability to analyze information and make logical decisions.<br>3. Social Interaction: The ability to communicate effectively in various social and professional environments.<br>4. Specialized knowledge: the acquisition of knowledge in a particular field of study or specialization.<br>5. Independence and self-learning: the ability to continuously learn and achieve goals independently |
| **Guidance Contents**<br>Guidance Contents | 1. Educational information: Provides basic concepts and principles to support the learning and thinking process.<br>2. Procedures and steps: Clear instructions on how to do certain tasks or activities.<br>3. Tips and tricks: Guidance to help improve performance or achieve better results.<br>4. Tools and Resources: A list of helpful resources such as books, websites, or apps.<br>5. Cultural and behavioral guidelines: Tips on how to handle social or professional situations appropriately. |

| Learning and teaching strategies<br>Learning and teaching strategies | |
|---|---|
| **Strategies** | • Interactive learning: Encouraging students to participate in classroom activities such as discussions, presentations, and problem solving..<br><br>• Blended learning: merging traditional education with technological tools such as online platforms to stimulate self-learning..<br><br>• Project-based learning: Students learn by working on real-world projects, helping to reinforce practical skills..<br><br>• Collaborative Learning: Encouraging teamwork among students to improve collaboration and knowledge sharing..<br><br>• Performance-oriented instruction: Guiding students to improve their academic performance through continuous assessments and clear goals.. |

| Student workload(SWL) | | | |
|---|---|---|---|
| The student's academic load is calculated for 15 weeks. | | | |
| **SWL Regulator (h/sem)** <br> Regular student load during the semester | 78 | **SWL Regulator (H/W)** <br> Regular weekly student load | 5 |
| **SWL unregulated (h/sem)** <br> Irregular student load during the semester | 72 | **SWL unregulated (h/w)** <br> Irregular student load per week | 5 |
| **totalSWL (h/sem)** <br> The student's total academic load during the semester | 30 | | |

| Unit Evaluation | | | | | |
|---|---|---|---|---|---|
| Course material evaluation | | | | | |
| **like** | | **time/number** | **Weight (in marks)** | **Due week** | **Related learning outcomes** |
| **Formative assessment** | **Competitions** | 2 | 10% (10) | 5, 10 | LO#1, 2, 10, 11 |
| | **Appointments** | 2 | 10% (10) | 2, 12 | LO #3, 4, 6, 7 |
| | **Projects/The laboratory.** | 1 | 10% (10) | continuous | all |
| | **a report** | 1 | 10% (10) | 13 | LO #5, 8, and 10 |
| **Final evaluation** | **Midterm Exam** | 2 s | 10% (10) | 7 | LO #1-7 |
| | **Final Exam** | 2 hours | 50% (50) | 16 | all |
| **Overall Rating** | | | 100%(100 degrees) | | |

| Delivery Plan (Weekly Syllabus) | |
|---|---|
| Theoretical weekly curriculum | |
| **week** | **Covered Materials** |
| **Week 1** | The first step in increasing their reading comprehension is to learn how to get the basic information. |
| **Week 2** | The first step in increasing their reading comprehension is to learn how to get the basic information. |
| **Week 3** | Sentence Structure: Learn all about the basic parts and components that make up a sentence and how to structure them to form meaningful sentences |
| **Week 4** | Sentence Structure: Learn all about the basic parts and components that make up a sentence and how to structure them to form meaningful sentences |

| | |
|---|---|
| **Week 5** | In **English**, **tenses** play a pivotal role in helping you present the information you intend to convey in a clear and accurate manner |
| **Week 6** | In **English**, **tenses** play a pivotal role in helping you present the information you intend to convey in a clear and accurate manner |
| **Week 7** | In **English**, **tenses** play a pivotal role in helping you present the information you intend to convey in a clear and accurate manner |
| **The week8** | In **English**, **tenses** play a pivotal role in helping you present the information you intend to convey in a clear and accurate manner |
| **The week9** | Indirect questions are a way of being polite. They are very, very common in English, especially when you're talking to someone you don't know. |
| **week10** | Indirect questions are a way of being polite. They are very, very common in English, especially when you're talking to someone you don't know. |
| **Week 11** | The **sentence** is the foundation of prose writing. A thorough understanding of core **sentence** structure and **sentence** elements |
| **Week 12** | The **sentence** is the foundation of prose writing. A thorough understanding of core **sentence** structure and **sentence** elements |
| **Week 13** | The **sentence** is the foundation of prose writing. A thorough understanding of core **sentence** structure and **sentence** elements |
| **Week 14** | Learn how to write **meeting minutes** to stay organized and impress your colleagues— plus formatting tips, samples, templates, and expert . |
| **Week 15** | Learn how to write **meeting minutes** to stay organized and impress your colleagues— plus formatting tips, samples, templates, and expert . |
| **Week 16** | Learn how to write **meeting minutes** to stay organized and impress your colleagues— plus formatting tips, samples, templates, and expert . |

| **Learning and teaching resources**<br>Learning and teaching resources | | |
|---|---|---|
| | **text** | **Available in the library?** |
| **Required texts** | Clinical Biochemistry,(8 editions), by Leipencotts | Yes |
| **Recommended Texts** | | Yes |
| **Websites** | | |

**Grading chart**

| Grading chart | | | | |
|---|---|---|---|---|
| group | degree | Appreciation | Tags(%) | identification |
| **Success Group (50 - 100)** | **A**-excellent | privilege | 90 - 100 | Outstanding performance |
| | **for**-very good | very good | 80 - 89 | Above average with some errors |
| | **G**-good | good | 70 - 79 | Good work with noticeable errors. |
| | **D**-Satisfactory | middle | 60 - 69 | Fair but with major shortcomings |
| | **h**-Enough | acceptable | 50 - 59 | The work meets minimum standards. |
| **Group failure (0 – 49)** | **FX** -to fail | Failed(Under Processing) | (45-49) | More work needed but credit given |
| | **F** -to fail | Failed | (0-44) | A lot of work required. |
| | | | | |

**note:** Marks that are 0.5 decimal places above or below the highest or lowest full mark will be rounded off (e.g. a mark of 54.5 will be rounded off to 55, while a mark of 54.4 will be rounded off to 54. The University has a policy of not condoning 'imminent pass failure', so the only adjustment to marks awarded by the original mark(s) will be the automatic rounding described above.