# نموذج وصف الوحدة

# نموذج وصف المادة الدراسية للاقسام الهندسية

| معلومات الوحدة<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| تسليم الوحدة | | | | عنوان الوحدة | الرسم الهندسي |
| نظريه ☐<br>حاضر ☐<br>المختبر ☒<br>تعليمي ☒<br>عملي ☐<br>الحلقه الدراسيه ☐ | | | | نوع الوحدة | الدعم أو نشاط التعلم ذي الصلة |
| | | | | رمز الوحدة | ENGD 101 |
| | | | | ائتمانات ECTS | 5 |
| | | | | SWL (ساعة / SEM) | 125 |
| 1 | | الفصل الدراسي للتسليم | | مستوى الوحدة | UGx11 1 |
| النوع كود الكلية | | الكليه | | الإدارة الإدارية | اكتب رمز القسم |
| البريد الإلكتروني:<br>mustafa.ha@uowa.edu.iq | | البريد الالكتروني | | قائد الوحدة | الاسم: Ass.Lec. مصطفى حبيب |
| | | مؤهلات قائد الوحدة | | لقب قائد الوحدة | |
| البريد الالكتروني | | البريد الالكتروني | | مدرس الوحدة | الاسم (إن وجد) |
| البريد الالكتروني | | البريد الالكتروني | | اسم المراجع النظير | اسم |
| 1.0 | | رقم الإصدار | | تاريخ اعتماد اللجنة العلمية | 01/06/2024 |

| العلاقة مع الوحدات الأخرى<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| | الفصل الدراسي | اي | وحدة المتطلبات الأساسية |
| | الفصل الدراسي | اي | وحدة المتطلبات المشتركة |

| أهداف الوحدة ونتائج التعلم والمحتويات الإرشادية<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| 1. توسيع القدرة العقلية على تخيل الأشكال الهندسية.<br>2. ضبط الجوانب العملية للمقرر من خلال الجلسات المختبرية.<br>3. تعريف الطلاب بالتصاميم الهندسية وأهميتها في تصنيع المنتجات<br>4. تعريف الطلاب بأساسيات الرسم الهندسي 3. لتمكين الطلاب ، فهم عناصر التصورD.<br>5. تعريف الطلاب بتقنيات الرسومات الفنية بحيث يمكن توصيل أفكار التصميم وإنتاجها.<br>6. تعريف الطلاب بالمتطلبات القياسية المرئية والمكتوبة المتعلقة بالصناعة.<br>7. لفهم وتفسير أي شكل من أشكال الرسومات الهندسية.<br>8. لرسم كائن من وجهات نظر منظور مختلفة. | **أهداف الوحدة**<br>أهداف المادة الدراسية |
| عند الانتهاء من هذه الدورة ، سيكون الطلاب قادرين على:<br>1- القدرة على قراءة وتحليل خرائط التصميم<br>2- القدرة على تمثيل التصاميم الهندسية ونقلها إلى واقع ملموس<br>3- <أن يكون الطلاب قادرين على فهم وصف أي تصميم غرافيكس<br>4- تعلم والتعرف على رموز الرسم الشائعة.<br>5- التعرف على تطوير وتقاطعات النماذج الهندسية الأساسية.<br>6- سيتمكن الطلاب من إنتاج رسومات عمل وفقا لمتطلبات الصناعة.<br>7- سيتمكن الطلاب من رسم المناظر المطلوبة لرسومات التجميع التي توضح جميع التفاصيل.<br>8- سيتمكن الطلاب من تطبيق مبادئ الرسم الفني على العديد من التطبيقات الهندسية. | **مخرجات التعلم للوحدة**<br>مخرجات التعلم للمادة الدراسية |
| يتضمن المحتوى الإرشادي ما يلي.<br>الجزء أ - مقدمة في أنماط الرسومات<br>الخطوط والخط وأنواع الأوراق والأدوات.<br>الجزء ب - تقنيات الرسم<br>تحديد أوراق الرسم ، الرسم باليد ، الرسم بالأدوات. | **المحتويات الإرشادية**<br>المحتويات الإرشادية |

| | |
|---|---|
| | .Dالجزء ج - التشغيل الهندسي وتطبيقات الرسم 2<br>.الجزء د - تقنيات الإسقاط وتطبيقات الإسقاط الإملائي<br>وجهات النظر والرسم متساوي القياس .Dأساليب وممارسات الرسم 3 - E الجزء |

| استراتيجيات التعلم والتعليم<br>استراتيجيات التعلم والتعليم | |
|---|---|
| .سرعة ودقة اتخاذ القرار -1<br>.تقديم شرح مفصل في الفصل حول الموضوع -2<br>.توفير رسم توضيحي كاف على السبورة بمساعدة جهاز عرض -3<br>.جعل فترات إلقاء المحاضرات تفاعلية وتكاملها بأعمال عملية -4<br>المواقع التعليمية -5<br>.إعطاء الطلاب أعمالا صفية خلال فترة المحاضرة -6<br>.إعطاء الواجبات المنزلية في نهاية كل محاضرة -7 | **استراتيجيات** |

| عبء عمل الطالب (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| 4 | **منظم (ح / ث) SWL**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 64 | **منظم SWL (h / sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل |
| 4 | **غير منظم (ح / ث) SWL**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 61 | **غير منظم SWL (h / sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل |
| 125 | | | **إجمالي SWL (h / sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل |

## تقييم الوحدة

تقييم المادة الدراسية

| نتائج التعلم ذات الصلة | الأسبوع المستحق | الوزن (بالعلامات) | الوقت/الرقم | مثل | |
|---|---|---|---|---|---|
| و 5 و 7 و 11 3 # LO | 3, 5,7,11 | 10% (10) | 4 | **مسابقات** | **التقييم التكويني** |
| كل | مستمر | 10% (10) | 14 | **الواجبات / الصفحة الرئيسية** | |
| كل | مستمر | 10% (10) | 15 | **المشاريع / المختبر** | |
| | | | | **تقرير** | |
| LO # 1-7 | 7-8 | 20% (20) | س 3 | **الامتحان النصفي** | **التقييم الختامي** |
| كل | 16 | 50% (50) | ساعات 3 | **الامتحان النهائي** | |
| | | 100٪ (100 درجة) | | **التقييم الإجمالي** | |

## خطة التسليم (المنهج الأسبوعي)

المنهاج الاسبوعي النظري

| | **المواد المغطاة** | **أسبوع** |
|---|---|---|
| مقدمة عن الرسم الهندسي والأدوات الواجب توفرها | مقدمة | **الأسبوع 1** |
| أنواع الخطوط، الاشكال الهندسية ومميزاتها | الخطوط والحروف والأشكال الهندسية وخصائصها | **الأسبوع 2** |
| تهيئة لوحة الرسم، كيفية البدء بالرسم الهندسي | إعداد الورقة ، بدء الرسم | **الأسبوع 3** |
| العمليات الهندسية -1 | العمليات الهندسية 1 | **الأسبوع 4** |
| العمليات الهندسية -2 | العمليات الهندسية2 | **الأسبوع 5** |
| العمليات الهندسية -3 | العمليات الهندسية 3 | **الأسبوع 6** |
| تمارين جامعة للعمليات الهندسية | تمارين العمليات الهندسية | **الأسبوع 7** |
| نظرية الاسقاط | نظرية الإسقاط | **الأسبوع 8** |
| المساقط | الإسقاط الإملائي 1 | **الأسبوع 9** |

| | | |
|---|---|---|
| المساقط -2 | الإسقاط الإملائي 2 | **اسبوع 10** |
| الابعاد | ابعاد | **اسبوع 11** |
| تمارين إضافية | تمارين صفية | **اسبوع 12** |
| المساقط المقطوعة -1 | المشاهدات المقطعية 1 | **اسبوع 13** |
| المساقط المقطوعة -2 | المشاهدات المقطعية 2 | **اسبوع 14** |
| الرسم المجسم | الرسم متساوي القياس | **اسبوع 15** |
| **الأسبوع التحضيري قبل الامتحان النهائي** | | **اسبوع 16** |

## خطة التسليم (منهج المختبر الأسبوعي)

المنهاج الاسبوعي للمختبر

| **المواد المغطاة** | **أسبوع** |
|---|---|
| | **الأسبوع 1** |
| | **الأسبوع 2** |
| | **الأسبوع 3** |
| | **الأسبوع 4** |
| | **الأسبوع 5** |
| | **الأسبوع 6** |
| | **الأسبوع 7** |

## مصادر التعلم والتعليم

مصادر التعلم والتدريس

| **متوفر في المكتبة؟** | **نص** | |
|---|---|---|
| نعم | الرسم الهندسي للمؤلف ( عبد الرسول الخفاف ) | **النصوص المطلوبة** |
| لا | | **النصوص الموصى بها** |
| مواقع الإنترنت | | **المواقع الإلكترونية** |

## مخطط الدرجات

مخطط الدرجات

| تعريف | العلامات (٪) | التقدير | درجة | مجموعة |
|---|---|---|---|---|
| أداء متميز | 90 - 100 | امتياز | ممتاز - **أ** | **مجموعة النجاح (50 - 100)** |
| فوق المتوسط مع بعض الأخطاء | 80 - 89 | جيد جدا | جيد جدا - **ب** | |
| عمل سليم مع أخطاء ملحوظة | 70 - 79 | جيد | جيد - **ج** | |
| عادل ولكن مع أوجه قصور كبيرة | 60 - 69 | متوسط | مرضية - **د** | |
| العمل يفي بالحد الأدنى من المعايير | 50 - 59 | مقبول | كافية - **هـ** | |
| مطلوب المزيد من العمل ولكن الائتمان الممنوح | (45-49) | راسب (قيد المعالجة) | فشل - **FX** | **فشل المجموعة (0 – 49)** |
| كمية كبيرة من العمل المطلوب | (0-44) | راسب | فشل - **F** | |
| | | | | |

**ملاحظة:** سيتم تقريب العلامات التي تزيد المنازل العشرية عن 0.5 أو تقل عن العلامة الكاملة الأعلى أو الأدنى (على سبيل المثال ، لدى الجامعة سياسة عدم التغاضي عن "فشل المرور .سيتم تقريب علامة 54.5 إلى 55 ، بينما سيتم تقريب علامة 54.4 إلى 54 الوشيك" ، لذا فإن التعديل الوحيد على العلامات الممنوحة بواسطة العلامة (العلامات) الأصلية سيكون التقريب التلقائي الموضح أعلاه.

# Unit Description Form

# Course Description Form

# Faculty of Engineering / Department of

## Unit Information

Course Information

| | | | |
|---|---|---|---|
| **Unit Title** | **Human Rights and Democracy** | **Unit delivery** | |
| **Unit Type** | **fundamental** | ☒ نظريه<br>☒ حاضر<br>☐ المختبر<br>☐ تعليمي<br>☐ عملي<br>☐ Seminar | |
| **Unit Code** | BME-12-02 | | |
| **ECTS Credits** | **8** | | |
| **SWL (ساعة / SEM)** | **60** | | |
| **Unit level** | 1 | **Delivery Semester** | 2 |
| **Administrative Management** | Watheq Qasim | **College** | College of engineering |
| **Unit Commander** | | **E-mail Address** | Sh watkiq.mar@uowa.edu.iq |
| **Title of Unit Commander** | Assistant Doctor | **Unit Commander Qualifications** | Doctor |
| **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 | • **Human rights concepts**: Definition of fundamental rights such as the right to life, liberty, and equality.<br>• **International documents**: study of international conventions such as the Universal Declaration of Human Rights and United Nations conventions.<br>Civil **and political rights**: Understand rights such as freedom of expression, suffrage, and protection from torture.<br>Economic**, Social and Cultural Rights**: Analysis of the rights of labor, education, and health care.<br>• **Mechanisms for the protection of human rights**: study of international and local organizations working to protect rights such as the United Nations and the Council of Europe.<br>International **human rights law**: Understand how human rights are applied in international and national courts.<br>1. • **Contemporary problems**: Discuss issues such as refugee rights, violence against women, and minority rights. |
| **Unit Learning Outcomes**<br><br>Learning outcomes of the course | • **Understanding human rights**: knowledge of fundamental rights and their charters.<br>• **Ability to enforce rights**: Understand domestic and international legal protection mechanisms.<br>• **Criticism and analysis**: Ability to analyze contemporary issues related to human rights.<br>1. • **Contribute to the protection of rights**: demonstrate the ability to participate in the promotion and protection of human rights. |
| **Indicative Contents**<br>Indicative Contents | 1. **Human Rights Corporal**: Understand the rights enjoyed by each individual regardless of their nationality or culture.<br>2. **Study of international conventions**: Identify the most important treaties and conventions that protect human rights.<br>3. **Analysis of contemporary issues**: Identify contemporary challenges affecting human rights.<br>4. **Application of human values**: Promote awareness of the importance of respecting human rights in daily life.<br><br>**Teaching Strategies:**<br><br>1. |

| Learning and Teaching Strategies<br>Learning and Teaching Strategies | |
|---|---|
| **Strategies** | • **Interactive learning**: Encourage discussions and projects related to human rights.<br>• **Case Studies**: Use case studies to discuss violations and solutions.<br>• **Seminars and discussions**: Organizing dialogue sessions to raise awareness of contemporary issues.<br>• **Online education**: Using online platforms to access information related to human rights. |

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

| 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) | | |

| خطة التسليم (المنهج الأسبوعي)<br>المنهاج الاسبوعي اعملي | |
|---|---|
| **أسابيع** | **المواد المغطاة** |
| 1 | حقوق الإنسان . تعريفها . اهدافها<br>حقوق الإنسان في الحضارات القديمةوفيالشرائعة السماوية |
| 2 | حقوق الإنسان في تاريخ المعاصر والحديث: الاعتراف بالإنسان منذ الحرب العالمية ألاولى وطائفة الأمم المتحدة<br>الاعتراف به وبالتالي الإنسان اللاتفاقية أوربية لحقوق الإنسان 1950 الأمريكية<br>الميثاق العربي لحقوق الإنسان 1969 الميثاق العربي لحقوق الإنسان 1981 |
| 3 | منظمات حقوق الإنسان وحقوق الإنسان ( 1- اللجنة الدولية للصليب الأحمر، 2- منظمة العفو الدولية<br>منظمة مراقبة حقوق الإنسان، المنظمات الوطنية لحقوق الإنسان<br>حقوق الإنسان في الدستور العراقي (الحق والحريات في دستور جمهورية العراق نهائي 2005 ) |
| 4 | اتفاق بين حقوق الإنسان والحريات العامة في الحماية العالمية لحقوق الإنسان<br>في الإعلان العالمي لحقوق الإنسان<br>في المواثيق غير المباشرة والدساتير الوطنية<br>حقوق الإنسان الاقتصادية والاجتماعية والبيئية الثقافية والتنموية وحقوق الإنسان المدنية السياسية. |
| 5 | حقوق الإنسان الحديثة ( الحق في التنمية، الحق في البيئة النظيفة، الحق في التضامن، الحق في الدين )<br>ضمانات حماية حقوق الإنسان على الصعيد الوطني . صلاحيات في الدستور والقوانين<br>الضمانات في مبدا بداية القانون اختلافات في ظل الدستورية الضمانات في حرية الصحافة<br>والراي العام دور المنظمات غير الحكومية في حماية وحماية حقوق الإنسان |
| 6 | ضمانات محمية لحماية حقوق الإنسان على المستوى الدولي<br>دور الأمم المتحدة ووكالاتها القضائية في توفير الضمانات<br>المنظمات التنظيمية ( الجامعة العربية ، الاتحاد الأوروبي ، الاتحاد الأوروبي ، منظمة الدول الأعضاء ) |

# Unit Description Form

## Course Description Form

## Faculty of Engineering / Department of

### Unit Information

Course Information

| | | | |
|---|---|---|---|
| **Unit Title** | **biochemistry** | **Unit delivery** | |
| **Unit Type** | **fundamental** | ☒ نظريه<br>☒ حاضر<br>☒ المختبر<br>☐ تعليمي<br>☐ عملي<br>☐ Seminar | |
| **Unit Code** | BME-11-07 | | |
| **ECTS Credits** | **8** | | |
| **SWL (ساعة / SEM)** | **200** | | |

| | | | |
|---|---|---|---|
| **Unit level** | 4 | **Delivery Semester** | 1 |
| **Department of Administration** | Biomedical Engineering | **College** | Faculty of Engineering |
| **Unit Commander** | Mariam Abdullah Saeb | **E-mail Address** | Mayram.ab@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** | 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. To know the types of food particles distinguish their properties.<br>2. To understand the structure of chemical molecules<br>3. This course deals with the basic concept of proteins.<br>4. This is the basic theme of all organic and inorganic molecules of the body.<br>5. Develop skills to deal with concentration .<br>6. Know the types of tools used in diagnosis. |
| **Unit Learning Outcomes**<br><br>Learning outcomes of the course | 1. Learn about proteins and amino acids.<br>2. Summarizing what carbohydrates are .<br>3. Learn about the function of enzymes .<br>4. discuss the most important enzymes that play a vital role in the mechanism,<br>5. Discuss the characteristics of prteins in each system<br>6. Explanation of circulatory lipids and tissues<br>7. describe the importance of adipose tissue and other organ<br>8. Discuss the most important dyes used in diagnosis<br>9. Description of immunohistochemistry technique<br>10. Electron microscopy and its importance in chemical diagnosis were discussed |
| **Indicative Contents**<br>Indicative Contents | The instructional content includes the following.<br><br>Fat metabolism of fats, fat structure, fat synthesis, alternative pathway, lipid degradation, fatty acids [12 hours].<br><br>Carbohydrates, glucose metabolism, glucose structure, glycolysis, inhibitory cycles, glycogen synthesis, glucose formation [12 hours].<br><br>Proteins , protein metabolism , protein synthesis , protein stimulation , anabolic proteins , protein fate , amino acids. [12 hours].<br><br>Hormones hormone synthesis, types of hormones, hormone function, hormone receptors, pituitary hormones. [20]hour]. |

| Learning and Teaching Strategies<br>Learning and Teaching Strategies | |
|---|---|
| **Strategies** | The main strategy that will be adopted in delivering this module is to encourage students to prepare for thawing, measuring concentration and laboratory technique, this will be achieved through interactive classrooms and tutorials and by considering the type of simple experiments that include some sampling activities of interest to students. |

| Student Workload (SWL)<br>The student's academic load is calculated for 15 weeks | | | |
|---|---|---|---|
| **SWL منظم (h / sem)**<br>Regular academic load of the student during the semester | 123 | **SWL regulator(h/s)**<br>Regular student load per week | 9 |
| **SWL غير منظم (h / sem)**<br>Irregular academic load of the student during the semester | 77 | **Unregulated SWL (h/s)**<br>Irregular student academic load per week | 6 |
| **SWL إجمالى (h / sem)**<br>The student's total academic load during the semester | 200 | | |

| 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 1** | Introduction to Chemistry Preparation of solutions, molars, molars, reagents, acids |
| **Week 2** | Alkaline, dielectric solution, concentration, titration |
| **Week 3** | Proteins , protein metabolism , protein synthesis , protein catalysis , protein synthesis , protein fate , amino acids |
| **Week 4** | Amino acid reaction, the relationship of amino acids with other molecules Protein synthesis , translation , transcription , globulin , albumin |
| **Week 5** | Liver function tests, bilirubin, GOT and AST , ALP , kidney function tests, urea, creatinine and uric acid |
| **Week 6** | Lipid metabolism, lipid synthesis, lipid synthesis, alternative pathway, lipid degradation, fatty acids |
| **Week 7** | Midterm Exam |

| | |
|---|---|
| **Week 8** | Cholesterol, triglycerides, HDL , LDL , ketone bodies, bile salt, lipase |
| **Week 9** | Carbohydrates, glucose metabolism, glucose synthesis, glycolysis, inhibitory cycles, glycogen synthesis, glucose formation |
| **Week 10** | Diabetes, hyperglycemia, HbA1C , fasting glucose, fructose, sucrose, lactose |
| **Week 11** | Enzymes, Enzyme metabolism, Enzyme types, Enzyme function, Enzyme synthesis |
| **Week 12** | Liver enzymes, kidney enzyme, digestive enzyme, coenzyme, glycolysis enzymes |
| **Week 13** | Hormones Hormone Synthesis , Types of Hormones , Hormone Function , Hormone Receptors , Pituitary Hormones |
| **Week 14** | Thyroid hormones, Adrenal hormones, sex hormones, digestive hormones, pinal hormones |
| **Week 15** | DNA, RNA, guanine, thiamine, cytosine, adenine, uracil |
| **Week 16** | Preparatory week before the final exam |

## Learning and Teaching Resources

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 (%) | 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** | **biochemistry** | **Unit delivery** | |
| **Unit Type** | **fundamental** | ☒ نظريه<br>☒ حاضر<br>☒ المختبر<br>☐ تعليمي<br>☐ عملي<br>☐ Seminar | |
| **Unit Code** | BME-11-07 | | |
| **ECTS Credits** | **8** | | |
| **SWL (ساعة / SEM)** | **200** | | |

| | | | |
|---|---|---|---|
| **Unit level** | 4 | **Delivery Semester** | 1 |
| **Department of Administration** | Biomedical Engineering | **College** | Faculty of Engineering |
| **Unit Commander** | Mariam Abdullah Saeb | **E-mail Address** | Mayram.ab@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** | 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. To know the types of food particles distinguish their properties.<br>2. To understand the structure of chemical molecules<br>3. This course deals with the basic concept of proteins.<br>4. This is the basic theme of all organic and inorganic molecules of the body.<br>5. Develop skills to deal with concentration .<br>6. Know the types of tools used in diagnosis. |
| **Unit Learning Outcomes**<br><br>Learning outcomes of the course | 1. Learn about proteins and amino acids.<br>2. Summarizing what carbohydrates are .<br>3. Learn about the function of enzymes .<br>4. discuss the most important enzymes that play a vital role in the mechanism,<br>5. Discuss the characteristics of prteins in each system<br>6. Explanation of circulatory lipids and tissues<br>7. describe the importance of adipose tissue and other organ<br>8. Discuss the most important dyes used in diagnosis<br>9. Description of immunohistochemistry technique<br>10. Electron microscopy and its importance in chemical diagnosis were discussed |
| **Indicative Contents**<br>Indicative Contents | The instructional content includes the following.<br><br>Fat metabolism of fats, fat structure, fat synthesis, alternative pathway, lipid degradation, fatty acids [12 hours].<br><br>Carbohydrates, glucose metabolism, glucose structure, glycolysis, inhibitory cycles, glycogen synthesis, glucose formation [12 hours].<br><br>Proteins , protein metabolism , protein synthesis , protein stimulation , anabolic proteins , protein fate , amino acids. [12 hours].<br><br>Hormones hormone synthesis, types of hormones, hormone function, hormone receptors, pituitary hormones. [20]hour]. |

| Learning and Teaching Strategies<br>Learning and Teaching Strategies | |
|---|---|
| **Strategies** | The main strategy that will be adopted in delivering this module is to encourage students to prepare for thawing, measuring concentration and laboratory technique, this will be achieved through interactive classrooms and tutorials and by considering the type of simple experiments that include some sampling activities of interest to students. |

| Student Workload (SWL)<br>The student's academic load is calculated for 15 weeks | | | |
|---|---|---|---|
| **SWL منظم (h / sem)**<br>Regular academic load of the student during the semester | 123 | **SWL regulator(h/s)**<br>Regular student load per week | 9 |
| **SWL غير منظم (h / sem)**<br>Irregular academic load of the student during the semester | 77 | **Unregulated SWL (h/s)**<br>Irregular student academic load per week | 6 |
| **SWL إجمالى (h / sem)**<br>The student's total academic load during the semester | 200 | | |

| 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 1** | Introduction to Chemistry Preparation of solutions, molars, molars, reagents, acids |
| **Week 2** | Alkaline, dielectric solution, concentration, titration |
| **Week 3** | Proteins , protein metabolism , protein synthesis , protein catalysis , protein synthesis , protein fate , amino acids |
| **Week 4** | Amino acid reaction, the relationship of amino acids with other molecules Protein synthesis , translation , transcription , globulin , albumin |
| **Week 5** | Liver function tests, bilirubin, GOT and AST , ALP , kidney function tests, urea, creatinine and uric acid |
| **Week 6** | Lipid metabolism, lipid synthesis, lipid synthesis, alternative pathway, lipid degradation, fatty acids |
| **Week 7** | Midterm Exam |

| | |
|---|---|
| **Week 8** | Cholesterol, triglycerides, HDL , LDL , ketone bodies, bile salt, lipase |
| **Week 9** | Carbohydrates, glucose metabolism, glucose synthesis, glycolysis, inhibitory cycles, glycogen synthesis, glucose formation |
| **Week 10** | Diabetes, hyperglycemia, HbA1C , fasting glucose, fructose, sucrose, lactose |
| **Week 11** | Enzymes, Enzyme metabolism, Enzyme types, Enzyme function, Enzyme synthesis |
| **Week 12** | Liver enzymes, kidney enzyme, digestive enzyme, coenzyme, glycolysis enzymes |
| **Week 13** | Hormones Hormone Synthesis , Types of Hormones , Hormone Function , Hormone Receptors , Pituitary Hormones |
| **Week 14** | Thyroid hormones, Adrenal hormones, sex hormones, digestive hormones, pinal hormones |
| **Week 15** | DNA, RNA, guanine, thiamine, cytosine, adenine, uracil |
| **Week 16** | Preparatory week before the final exam |

## Learning and Teaching Resources

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 (%) | 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** | **Physics** | | **Unit delivery** |
| **Unit Type** | **fundamental** | | ☒ نظريه<br>☒ حاضر<br>☐ المختبر<br>☐ تعليمي<br>☐ عملي<br>☐ Seminar |
| **Unit Code** | ENG 104 | | |
| **ECTS Credits** | **7** | | |
| **SWL (ساعة / SEM)** | **175** | | |
| **Unit level** | 4 | **Delivery Semester** | 2 |
| **Department of Administration** | Biomedical Engineering | **College** | Faculty of Engineering |
| **Unit Commander** | Maryam Abdullah Saib | **E-mail Address** | Mayram.ab@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** | 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. To real engineering problem solving and preparing the student for more advanced studies in engineering mechanics.<br>2. To understand static and moving bodies, force, moment, resultants, equilibrium, mas and acceleration, moment of inertia and polar moment of inertia, Impulse and momentum, energy and power.<br>3. To understand first and second Newtons Laws problems.<br>4. to use the techniques, skills, and modern engineering tools necessary for engineering practice. |
| **Unit Learning Outcomes**<br><br>Learning outcomes of the course | On completion of the module the student is expected to be able to:<br>1. Explain the two Newton's laws used in engineering mechanics.<br>2. Overcome any misconceptions about engineering mechanics ( force, energy, power, work etc).<br>3. Reiterate formal problem-solving skills in a form more convenient for engineering applications.<br>4. Get hold of four basic thinking skills:<br>I. Consciously inconsistences involving their preconceptions about mechanics<br>II. Arrange systematically the ideas of mechanics in a problem-solving form<br>III. Apply mechanics principles to given realistic engineering problem<br>IV. Solve realistic engineering problem. |
| **Indicative Contents**<br>Indicative Contents | Indicative content includes the following.<br><br>**Part A – Static**<br>Static bodies, and force systems. [15 hrs ]<br>Resultant of forces. [9 hrs]<br>Equilibrium of static bodies. [9 hrs]<br>Three dimensional force system. [9 hrs]<br>Centroid, center of mass, Moment of inertia and polar moment of inertia. [9 hrs]<br>Distributed force – friction. [9 hrs]<br><br>**Part B – Dynamic**<br>Moving bodies. [6 hrs]<br>Absolute motion. [6 hrs]<br>Force, mass and acceleration. [6 hrs]<br>Force, energy and power. [6 hrs]<br>Impulse and momentum. [6 hrs] |

| Learning and Teaching Strategies<br>Learning and Teaching Strategies | |
|---|---|
| **Strategies** | 1. Active learning: Encouraging students to actively participate by solving exercises and problems on their own, which enhances their understanding of mathematical concepts.<br>2. Cooperative learning: Teamwork to solve mathematical problems, which helps exchange ideas and develop analytical skills.<br>3. Continuous assessment: Conduct short tests and regular exercises to monitor students' progress and identify points that need strengthening.<br>4. Explanation and discussion: Encourage students to explain their solutions and ways of thinking to stimulate deep understanding and improve communication skills. |

| Student Workload (SWL)<br>The student's academic load is calculated for 15 weeks | | | |
|---|---|---|---|
| **SWL منظم (h / sem)**<br>Regular academic load of the student during the semester | 108 | **SWL regulator(h/s)**<br>Regular student load per week | 6 |
| **SWL غير منظم (h / sem)**<br>Irregular academic load of the student during the semester | 67 | **Unregulated SWL (h/s)**<br>Irregular student academic load per week | 6 |
| **SWL إجمالى (h / sem)**<br>The student's total academic load during the semester | 175 | | |

| 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 1** | Introduction to 2D and 3D system, rectangular component |
| **Week 2** | Power systems |
| **Week 3** | Determination |
| **Week 4** | Double moments |
| **Week 5** | Outcomes |
| **Week 6** | Balance |
| **Week 7** | Structures 1 |
| **Week 8** | Structures 2 |
| **Week 9** | Midterm exam 1 |
| **Week 10** | Inertia |
| **Week 11** | Center of mass |
| **Week 12** | Distributed loads |
| **Week 13** | Friction 1 |
| **Week 14** | Friction 2 |
| **Week 15** | Midterm exam 2 |

| Learning and Teaching Resources<br>Learning and Teaching Resources | | |
|---|---|---|
| | **text** | **Available in the library?** |
| **Required texts** | Engineering Mechanics, STATICS 6th Edition J.L. MERIAM | Yes |
| **Required texts** | Engineering Mechanics, DYNAMICS 6th Edition J.L. MERIAM | Yes |
| **Websites** | | |

| 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

| Module Information | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Mathematics II** | | | **Module Delivery** | |
| **Module Type** | **Basic learning** | | | ☒ Theory<br>☒ Lecture<br>☐ Lab<br>☒ Tutorial<br>☐ Practical<br>☐ Seminar | |
| **Module Code** | ENG102 | | | | |
| **ECTS Credits** | 6 | | | | |
| **SWL (hr/sem)** | 051 | | | | |
| **Module Level** | | 1 | **Semester of Delivery** | | **2** |
| **Administering Department** | | | **College** | **Engineering College** | |
| **Module Leader** | **Assist. Lect Hasan Allawi** | | **e-mail** | Hassan.as@uowa.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** | | 1/6/2023 | **Version Number** | | 1.0 |

| Relation with other Modules | | | |
|---|---|---|---|
| **Prerequisite module** | Mathematics I | **Semester** | 1 |
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents

| | |
|---|---|
| **Module Aims** | The aims of a mathematics module are 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. Additionally, the module aims to prepare students for future academic and professional pursuits that require mathematical proficiency. |
| **Module Learning Outcomes** | By the end of this module the student should be able to:<br>1. Use asymptotic, first and second derivatives to graph functions.<br>2. Apply advanced rules/techniques of integration to compute integrals. sketch graphs of functions; approximation of functions.<br>3. Describe the polar coordinate system.<br>4. Convert from rectangular coordinates to polar coordinates.<br>5. Apply matrix techniques and elementary theory to problem in engineering.<br>6. Solve systems of linear equations and find the inverse of a matrix.<br>7. Perform the basic algebra operation of vectors.<br>8. Evaluate the scalar and vector product of two vectors.<br>9. Evaluate the gradient, divergence and curl of various scalar and vector fields.<br>10. Complex Numbers: Algebra of complex numbers, Solution of polynomial equations with complex roots, Argand Diagrams, Polar form of complex numbers, Exponential form of complex numbers, and Series expansion of trigonometric and exponential functions, De Moivre's theorem. |
| **Indicative Contents** | The Indicative Contents of a Mathematics module will depend on the level and scope of the course. However, some common topics that may be covered in a mathematics module include:<br>1. Arithmetic: Basic mathematical 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, sizes, positions, and measurements of objects in space.<br>4. Calculus: The study of mathematical concepts such as limits, derivatives, and integrals.<br>Overall, the Indicative Contents of a Mathematics module aims to provide students with a comprehensive understanding of mathematical concepts and their applications in various fields of study. |

| **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 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)** | 78 | **Structured SWL (h/w)** | 6 |
| **Unstructured SWL (h/sem)** | 72 | **Unstructured SWL (h/w)** | 4 |
| **Total SWL (h/sem)** | 150 | | |

## 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 | |
| | Report | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| Summative assessment | Midterm Exam | 2hr | 10% (10) | 7 | LO # 1-7 |
| | Final Exam | 3hr | 50% (50) | 16 | All |
| Total assessment | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

| | Material Covered |
|---|---|
| Week 1<br>Week 2<br>Week 3 | **Transcendental Functions:** Inverse Functions and Their Derivatives, Natural Logarithms, Exponential Functions, Indeterminate Forms and L'Hôpital's Rule, Inverse Trigonometric Functions, Hyperbolic Functions and their inverse. |
| Week 4<br>Week 5 | **Integration Techniques:** Integration by Parts, Trigonometric Integrals, Trigonometric Substitutions, Partial Fractions, Improper Integrals. |
| Week 6 | **Polar Coordinates:** Polar Coordinates 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, Inverse of a matrix, Solution of linear system equations, Eigenvalues and Eigenvectors**.** |
| Week 10<br>Week 11<br>Week 12 | **Vector Theory:** Three-Dimensional Coordinate Systems, Representation of vectors 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, Solution of quadratic equations, The argand diagram, Polar form of a complex number, Demoiver's theorem. |
| Week 16 | Preparatory week before the final Exam |

## Learning and Teaching Resources

| | Text | Available in the Library? |
|---|---|---|
| Required Texts | George B. Thomas Jr., "CALCULUS", 14th Ed | Yes |
| Recommended Texts | 1. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Ed.<br>2. Schaum's Outline of College Mathematics, Fourth Edition.<br>3. Mary Attenborough, "Mathematics for Electrical Engineering and Computing", 1st Ed. | No |
| Websites | Topics in a Calculus -Wolfram Mathworld. | |

| 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.

# MODULE DESCRIPTION FORM

| Module Information | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Mathematics II** | | | **Module Delivery** | |
| **Module Type** | **Basic learning** | | | ☒ Theory<br>☒ Lecture<br>☐ Lab<br>☒ Tutorial<br>☐ Practical<br>☐ Seminar | |
| **Module Code** | ENG102 | | | | |
| **ECTS Credits** | 6 | | | | |
| **SWL (hr/sem)** | 051 | | | | |
| **Module Level** | | 1 | **Semester of Delivery** | | **2** |
| **Administering Department** | | | **College** | **Engineering College** | |
| **Module Leader** | **Assist. Lect Hasan Allawi** | | **e-mail** | Hassan.as@uowa.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** | | 1/6/2023 | **Version Number** | | 1.0 |

| Relation with other Modules | | | |
|---|---|---|---|
| **Prerequisite module** | Mathematics I | **Semester** | 1 |
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents

| | |
|---|---|
| **Module Aims** | The aims of a mathematics module are 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. Additionally, the module aims to prepare students for future academic and professional pursuits that require mathematical proficiency. |
| **Module Learning Outcomes** | By the end of this module the student should be able to:<br>1. Use asymptotic, first and second derivatives to graph functions.<br>2. Apply advanced rules/techniques of integration to compute integrals. sketch graphs of functions; approximation of functions.<br>3. Describe the polar coordinate system.<br>4. Convert from rectangular coordinates to polar coordinates.<br>5. Apply matrix techniques and elementary theory to problem in engineering.<br>6. Solve systems of linear equations and find the inverse of a matrix.<br>7. Perform the basic algebra operation of vectors.<br>8. Evaluate the scalar and vector product of two vectors.<br>9. Evaluate the gradient, divergence and curl of various scalar and vector fields.<br>10. Complex Numbers: Algebra of complex numbers, Solution of polynomial equations with complex roots, Argand Diagrams, Polar form of complex numbers, Exponential form of complex numbers, and Series expansion of trigonometric and exponential functions, De Moivre's theorem. |
| **Indicative Contents** | The Indicative Contents of a Mathematics module will depend on the level and scope of the course. However, some common topics that may be covered in a mathematics module include:<br>1. Arithmetic: Basic mathematical 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, sizes, positions, and measurements of objects in space.<br>4. Calculus: The study of mathematical concepts such as limits, derivatives, and integrals.<br>Overall, the Indicative Contents of a Mathematics module aims to provide students with a comprehensive understanding of mathematical concepts and their applications in various fields of study. |

| **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 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)** | 78 | **Structured SWL (h/w)** | 6 |
| **Unstructured SWL (h/sem)** | 72 | **Unstructured SWL (h/w)** | 4 |
| **Total SWL (h/sem)** | 150 | | |

## 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 | |
| | Report | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| Summative assessment | Midterm Exam | 2hr | 10% (10) | 7 | LO # 1-7 |
| | Final Exam | 3hr | 50% (50) | 16 | All |
| Total assessment | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

| | Material Covered |
|---|---|
| Week 1<br>Week 2<br>Week 3 | **Transcendental Functions:** Inverse Functions and Their Derivatives, Natural Logarithms, Exponential Functions, Indeterminate Forms and L'Hôpital's Rule, Inverse Trigonometric Functions, Hyperbolic Functions and their inverse. |
| Week 4<br>Week 5 | **Integration Techniques:** Integration by Parts, Trigonometric Integrals, Trigonometric Substitutions, Partial Fractions, Improper Integrals. |
| Week 6 | **Polar Coordinates:** Polar Coordinates 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, Inverse of a matrix, Solution of linear system equations, Eigenvalues and Eigenvectors**.** |
| Week 10<br>Week 11<br>Week 12 | **Vector Theory:** Three-Dimensional Coordinate Systems, Representation of vectors 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, Solution of quadratic equations, The argand diagram, Polar form of a complex number, Demoiver's theorem. |
| Week 16 | Preparatory week before the final Exam |

## Learning and Teaching Resources

| | Text | Available in the Library? |
|---|---|---|
| Required Texts | George B. Thomas Jr., "CALCULUS", 14th Ed | Yes |
| Recommended Texts | 1. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Ed.<br>2. Schaum's Outline of College Mathematics, Fourth Edition.<br>3. Mary Attenborough, "Mathematics for Electrical Engineering and Computing", 1st Ed. | No |
| Websites | Topics in a Calculus -Wolfram Mathworld. | |

| 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.

# Unit Description Form

# Course Description Form

# Faculty of Engineering / Department of

## Unit Information

Course Information

| | | | |
|---|---|---|---|
| **Unit Title** | **Computer Programming** | | **Unit delivery** |
| **Unit Type** | **secondary** | | ☒ 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** | 2 | **Delivery Semester** | 2 |
| **Department of Administration** | Biomedical Engineering | **College** | Faculty of Engineering |
| **Unit Commander** | Karrar aqeel huseein | **E-mail Address** | karrar.aqeel@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** | 22/1/2025 | **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

| | | | |
|---|---|---|---|
| **SWL منظم (h / sem)**<br>Regular academic load of the student during the semester | 35 | **SWL regulator(h/s)**<br>Regular student load per week | 5 |
| **SWL غير منظم (h / sem)**<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 | | | | |
|---|---|---|---|---|
| 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.

# modelUnit Description

# Subject Description FormY

# Faculty of Engineering / Department of

## Unit information

Subject information

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

| | | | |
|---|---|---|---|
| **Unit level** | 1 | **Semester for delivery** | 2 |
| **Administration Department** | Biomedical Engineering | **The college** | College of Engineering |
| **Unit Commander** | Saad Mahmoud | **e-mail** | Saed.mahmud@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** | 26/9/2024 | **issue number** | 1.0 |

## Relationship with other units

Relationship with other subjects

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

| 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 learning using technology. Academic outcomes include language proficiency, the ability to read scientific research, and interact in multicultural environments. |
| **Unit learning outcomes**<br><br>Learning outcomes for the subject | 1. Master basic skills: such as reading, writing, listening, and speaking.<br>2. Critical and creative thinking: Develop the ability to analyze information and make logical decisions.<br>3. Social Interaction: The ability to interact effectively in diverse social and professional settings.<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>• Blended learning: merging traditional education with technological tools such as online platforms to stimulate self-learning..<br>• Project-based learning: Students learn by working on real-world projects, helping to reinforce practical skills..<br>• Collaborative Learning: Encouraging teamwork among students to improve collaboration and knowledge sharing..<br>• Performance-oriented instruction: Guiding students to improve their academic performance through continuous assessments and clear goals.. |

| Student workload(SWL)<br>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<br>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)<br>Theoretical weekly curriculum | |
|---|---|
| **week** | **Covered Materials** |
| **Week 1** | |
| **Week 2** | |
| **Week 3** | |
| **Week 4** | |
| **Week 5** | |
| **Week 6** | |
| **Week 7** | |
| **The week8** | |
| **The week9** | |

| | |
|---|---|
| **week10** | |
| **Week 11** | |
| **Week 12** | |
| **Week 13** | |
| **Week 14** | |
| **Week 15** | |
| **Week 16** | |

| **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.

| | | |
|---|---|---|
| | Ministry of Higher Education and Scientific Research - Iraq<br><br>University of Warith Al_Anbiyaa<br>Engineering College<br>Department of Biomedical Engineering | |

# MODULE DESCRIPTOR FORM

| Module Information | | | | | |
|---|---|---|---|---|---|
| **Module Title** | ELECTRICAL CIRCUITS II | | | **Module Delivery** | |
| **Module Type** | BASIC | | | ☒**Theory**<br>☒**Lecture**<br>☒**Lab**<br>☒**Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | BME-122 | | | | |
| **ECTS Credits** | 6 | | | | |
| **SWL (hr/sem)** | 150 | | | | |
| **Module Level** | | UGI | **Semester of Delivery** | | 2 |
| **Administering Department** | | WBM | **College** | ENG | |
| **Module Leader** | Hussein Abdulkareem Saleh | | **e-mail** | Hussein.abd@uowa.edu.iq | |
| **Module Leader's Acad. Title** | | Assistant Professor | **Module Leader's Qualification** | | Ph.D. |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | | Name | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | | | **Version Number** | | 1.0 |

| Relation with other Modules | | | |
|---|---|---|---|
| **Prerequisite module** | Electrical Circuits I | **Semester** | 1 |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes, and Indicative Contents | |
|---|---|
| **Module Aims** | 1. To develop problem-solving skills and understanding of circuit theory through the application of techniques.<br>2. To understand AC Principles, general alternating waveforms, sine wave, phasor relations, and average and effective values.<br>3. This course deals with the alternating principles of electrical circuits.<br>4. To understand the representation of sinusoidal waveform in domain and time domain.<br>5. To understand the series RL AC circuit, series RC AC circuit, and series RLC AC circuit<br>6. To perform series resonance circuits, parallel resonance and parallel quality factor are used. |
| **Module Learning Outcomes** | 1. Recognize how A.C. electricity works in electrical circuits.<br>2. List the various terms associated with electrical circuits.<br>3. Summarize what A.C. electric circuit means.<br>4. Discuss the reaction and involvement of resonance in electric circuits.<br>5. Describe،series RC AC circuit, series RLC AC circuit<br>6. Define Ohm's law.<br>7. Identify the basic applications of AC circuits.<br>8. Discuss the operations of sinusoids and phasors in an electric circuit.<br>9. Discuss the various properties of resistors, capacitors, and inductors.<br>10. Identify the capacitor and inductor phasor relationship with respect to voltage and current. |

| | |
|---|---|
| **Indicative Contents** | Indicative content includes the following.<br><br>AC Principles, general alternating waveforms, sine wave, phasor relations, average and effective values, complex numbers, representation of sinusoidal waveform in domain and time domain., Series AC Circuits, impedance and phasor diagram: resistor, inductor and capacitor, series RL AC circuit, series RC AC circuit, series RLC AC circuit, voltage divider rule, response of RLC to voltage and current, response of RLC to frequency, Parallel AC Circuits, parallel RL AC circuit, parallel RC AC circuit, parallel RLC AC circuit, AC Power; power triangle and power factor Electrical Circuit Analysis Methods, Mesh Analysis Method, Nodal Analysis Method, bridge networks, star-delta and delta-star circuits conversion, AC Network Theorems, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem, Resonance, series resonance; series quality factor, selectivity curve and bandwidth frequencies for series resonance circuits, Parallel Resonance, parallel quality factor, Pulse Waveforms and the R-C Response, pulse definition and duty cycle, R-C response to the square wave input., Polyphase Systems ( Three-Phase ), Transformers, AC Machine. |
| **Learning and Teaching Strategies** | |
| **Strategies** | The primary strategy for delivering this module will focus on actively engaging students in exercises designed to enhance their critical thinking skills. This will be achieved through a combination of lectures, interactive tutorials, and hands-on experiments featuring engaging and practical activities. |

| Student Workload (SWL) | | | |
|---|---|---|---|
| **Structured SWL (h/sem)** | 93 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 6 |
| **Unstructured SWL (h/sem)** | 57 | **Unstructured SWL (h/w)** | 4 |
| **Total SWL (h/sem)** | 150 | | |

| 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** | AC Principles, general alternating waveforms, sine wave. |
| **Week 2** | Phasor relations, average and effective values. |
| **Week 3** | Complex numbers. |
| **Week 4** | Representation of sinusoidal waveform in frequency domain and time domain. |
| **Week 5** | Series AC Circuits, impedance and phasor diagram: resistor, inductor and capacitor, series RL AC circuit, series RC AC circuit. |
| **Week 6** | Series RLC AC circuit, voltage divider rule, response of RLC to voltage and current, response of RLC to frequency. |
| **Week 7** | Mid-term Exam |
| **Week 8** | Parallel AC Circuits, parallel RL AC circuit, parallel RC AC circuit, parallel RLC AC circuit AC Power; power triangle and power factor . |
| **Week 9** | Electrical Circuit Analysis Methods, Mesh Analysis Method, Nodal Analysis Method. |
| **Week 10** | AC Network Theorems, Superposition Theorem, Thevenin's Theorem, Norton's Theorem. |
| **Week 11** | Resonance, series resonance.. |
| **Week 12** | Series quality factor, selectivity curve and bandwidth frequencies for series resonance circuits. |
| **Week 13** | Parallel Resonance, parallel quality factor, |
| **Week 14** | Series magnetic circuit |
| **Week 15** | **Parallel magnetic circuit** |
| **Week 16** | **Preparatory week before the final Exam** |

| Delivery Plan (Weekly Lab. Syllabus) | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab 1: Introduction to AC circuit |
| **Week 2** | Lab 2: RL series AC circuit |
| **Week 3** | Lab 3: RC series AC circuit |
| **Week 4** | Lab 4: RLC series AC circuit |
| **Week 5** | Lab 5: RLC parallel AC circuit |
| **Week 6** | Lab 6: series resonance AC circuit |
| **Week 7** | Lab 7: parallel resonance AC circuit |

| Learning and Teaching Resources | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education | Yes |
| **Recommended Texts** | DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents. | No |
| **Websites** | https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering | |

| 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.

# Unit Description Form

# Course Description Form

# Faculty of Engineering / Department of

## Unit Information

Course Information

| | | | |
|---|---|---|---|
| **Unit Title** | **Medical Physics** | **Unit delivery** | |
| **Unit Type** | **fundamental** | ☒ نظريه<br>☒ حاضر<br>☒ المختبر<br>☐ تعليمي<br>☐ عملي<br>☐ Seminar | |
| **Unit Code** | BME-12-04 | | |
| **ECTS Credits** | **8** | | |
| **SWL (ساعة / SEM)** | **105** | | |
| **Unit level** | 1 | **Delivery Semester** | 2 |
| **Department of Administration** | Biomedical Engineering | **College** | Faculty of Engineering |
| **Unit Commander** | Kawthar Ali Hassan | **E-mail Address** | kawther.ha@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** | 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 applications of physical principles in medicine such as radiology and magnetism.<br>• Improve medical imaging techniques such as X-ray andMRI for accurate diagnosis.<br>• Develop radiation therapy techniques to accurately treat tumors and reduce side effects.<br>• Ensure patient safety by reducing unnecessary radiation doses.<br>• Analyze computer data and models to improve treatment and medical monitoring.<br>• Training students on the use and calibration of medical devices to ensure their accuracy.<br>• Provide the fundamentals of physics for its medical applications in the safe and effective treatment and diagnosis. |
| **Unit Learning Outcomes**<br><br>Learning outcomes of the course | 1. Understand the physical principles in medical diagnosis and treatment.<br>2. Master medical imaging techniques such as X-ray and MRI.<br>3. Apply radiation therapy techniques accurately.<br>4. Ensure radiation safety for patients and staff.<br>5. Calibration of medical devices to ensure their accuracy.<br>6. Analyze data to improve diagnosis and treatment.<br>7. Apply practical skills in medical work environments.<br>8. |
| **Indicative Contents**<br>Indicative Contents | 1. Basic physical principles (X-ray, electricity, magnetism).<br>2. Medical imaging techniques (X-ray, MRI, CT).<br>3. Radiation therapy (IMRT, IGRT).<br>4. Radiation protection to reduce exposure.<br>5. Calibration and testing of medical devices.<br>6. Biological and radiological measurements.<br>7. Research and development in medical physics. |

| Learning and Teaching Strategies<br>Learning and Teaching Strategies | |
|---|---|
| **Strategies** | Improve medical imaging techniques such as X-ray and MRI to reduce radiation dose and increase image resolution.<br>Radiation therapy using precise techniques such as IMRT and IGRT to improve tumor targeting and reduce the impact on healthy tissue.<br>Reduce radiation doses through precise guidance techniques and provide protection to patients.<br>Quality control in medical devices and ensuring their efficiency and safety.<br>Research and development of new technologies such as artificial intelligence and nanotechnology to improve treatments.<br>All these strategies aim to improve treatment efficiency and ensure patient safety. |

| Student Workload (SWL)<br>The student's academic load is calculated for 15 weeks | | | |
|---|---|---|---|
| **SWL منظم (h / sem)**<br>Regular academic load of the student during the semester | 78 | **SWL regulator(h/s)**<br>Regular student load per week | 5 |
| **SWL غير منظم (h / sem)**<br>Irregular academic load of the student during the semester | 72 | **Unregulated SWL (h/s)**<br>Irregular student academic load per week | 5 |
| **SWL إجمالى (h / sem)**<br>The student's total academic load during the semester | 105 | | |

| 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 1** | Introduction to Chemistry Preparation of solutions, molars, molars, reagents, acids |
| **Week 2** | Alkaline, dielectric solution, concentration, titration |
| **Week 3** | Proteins , protein metabolism , protein synthesis , protein catalysis , protein synthesis , protein fate , amino acids |
| **Week 4** | Amino acid reaction, the relationship of amino acids with other molecules Protein synthesis , translation , transcription , globulin , albumin |
| **Week 5** | Liver function tests, bilirubin, GOT and AST , ALP , kidney function tests, urea, creatinine and uric acid |
| **Week 6** | Lipid metabolism, lipid synthesis, lipid synthesis, alternative pathway, lipid degradation, fatty acids |
| **Week 7** | Midterm Exam |

| | |
|---|---|
| **Week 8** | Cholesterol, triglycerides, HDL , LDL , ketone bodies, bile salt, lipase |
| **Week 9** | Carbohydrates, glucose metabolism, glucose synthesis, glycolysis, inhibitory cycles, glycogen synthesis, glucose formation |
| **Week 10** | Diabetes, hyperglycemia, HbA1C , fasting glucose, fructose, sucrose, lactose |
| **Week 11** | Enzymes, Enzyme metabolism, Enzyme types, Enzyme function, Enzyme synthesis |
| **Week 12** | Liver enzymes, kidney enzyme, digestive enzyme, coenzyme, glycolysis enzymes |
| **Week 13** | Hormones Hormone Synthesis , Types of Hormones , Hormone Function , Hormone Receptors , Pituitary Hormones |
| **Week 14** | Thyroid hormones, Adrenal hormones, sex hormones, digestive hormones, pinal hormones |
| **Week 15** | DNA , RNA , guanine, thiamine, cytosine, adenine, uracil |
| **Week 16** | Preparatory week before the final exam |

## Learning and Teaching Resources

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 (%) | 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

| Module Information | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Mathematics I** | | | **Module Delivery** | |
| **Module Type** | **Basic learning** | | | ☒ Theory<br>☒ Lecture<br>☐ Lab<br>☒ Tutorial<br>☐ Practical<br>☐ Seminar | |
| **Module Code** | ENG101 | | | | |
| **ECTS Credits** | 6 | | | | |
| **SWL (hr/sem)** | 150 | | | | |
| **Module Level** | 1 | | **Semester of Delivery** | 1 | |
| **Administering Department** | | | **College** | **Engineering College** | |
| **Module Leader** | **Assist. Lec: Karrar Aqeel Hussein** | | **e-mail** | karraraqeel@uowa.edu.iq | |
| **Module Leader's Acad. Title** | | | **Module Leader's Qualification** | | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 1/6/2024 | | **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** | The aims of a mathematics module are to provide students with an understanding of mathematical concepts, skills, and techniques that can be applied to a range of real-world problems. This includes topics such as An introductory class in the theory and techniques of differentiation and integration of algebraic and trigonometric functions. Additionally, the module aims to prepare students for future academic and professional pursuits that require mathematical proficiency. |
| **Module Learning Outcomes** | On successful completion of this module, students will be able to:<br>1. Find the domain and range of a function and graphs.<br>2. Evaluate limits, and determine continuity and differentiability of functions.<br>3. Apply rules of calculus to solve engineering problems including differential equations.<br>4. Differential calculus, these concepts are used to analyze rates of change, optimization problems, and the behavior of functions in engineering applications.<br>5. Integration: Table of integrals, Rules of integration, Definite integrals, Area bounded by curves, Integration by parts, Integration by substitution and using partial fractions.<br>6. Student should use more than one method to solve the integration.<br>7. Express and evaluate a double and triple integral in terms of the Cartesian.<br>8. Calculate area, volume, and surface area of integral.<br>9. Application of Integration: Centres of mass, Moments of inertia. |
| **Indicative Contents** | The Indicative Contents of a Mathematics module will depend on the level and scope of the course. However, some common topics that may be covered in a mathematics module include:<br>1- Arithmetic: Basic mathematical 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, sizes, positions, and measurements of objects in space.<br>4- Calculus: The study of mathematical concepts such as limits, derivatives, and integrals.<br>Overall, the Indicative Contents of a Mathematics module aims to provide students with a comprehensive understanding of mathematical concepts and their applications in various fields of study. |
| **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 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)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 78 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 72 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 150 | | |

## 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 | |
| | Report | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| Summative assessment | Midterm Exam | 2hr | 10% (10) | 7 | LO # 1-7 |
| | Final Exam | 3hr | 50% (50) | 16 | All |
| Total assessment | | | 100% (100 Marks) | | |

| Delivery Plan (Weekly Syllabus) | |
|---|---|
| | **Material Covered** |
| **Week 1** | **Functions:** Domain and Range, Functions and their graphs, Trigonometric Functions. |
| **Week 2**<br>**Week 3** | **Limits and Continuity:** Limit of a Function and Limit Laws, One-Sided Limits Continuity, Limits Involving Infinity, Asymptotes of Graphs. |
| **Week 4**<br>**Week 5**<br>**Week 6** | **Derivatives**: Tangent Lines and the Derivative at a Point, The Derivative as a Function, Differentiation Rules, Derivatives of Trigonometric Functions, The Chain Rule, Implicit Differentiation, Linearization and Differentials. |
| **Week 7**<br>**Week 8**<br>**Week 9** | **Applications of Derivatives:** Extreme Values of Functions, The Mean Value Theorem, Monotonic Functions and the First Derivative Test, Concavity and Curve Sketching, Applied Optimization, Antiderivatives |
| **Week 10**<br>**Week 11**<br>**Week 12** | **Integrals:** The Definite Integral, The Fundamental Theorem of Calculus, Indefinite Integrals and the Substitution Method, Definite Integral Substitutions and the Area Between Curves. |
| **Week 13**<br>**Week 14**<br>**Week 15** | **Applications of Definite Integrals:** Volumes using Cross-Sections, Volumes using Washer and Cylindrical Shells methods, Arc Length, Areas of Surfaces of Revolution, Work and Fluid Forces, Moments and Centers of Mass. |
| **Week 16** | Preparatory week before the final Exam |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | George B. Thomas Jr., "CALCULUS", 14th Ed | Yes |
| **Recommended Texts** | 1. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Ed.<br>2. Schaum's Outline of College Mathematics, Fourth Edition.<br>3. Mary Attenborough, "Mathematics for Electrical Engineering and Computing", 1st Ed. | No |
| **Websites** | Topics in Calculus -Wolfram Mathworld. | |

| Grading Scheme<br>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.