



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

**وصف البرنامج الأكاديمي  
والمقرر الدراسي  
2026-2025**

**العداد**

**وحدة ضمان الجودة**

**كلية الهندسة - قسم الهندسة المدنية**

## المقدمة:

يُعد البرنامج التعليمي بمثابة حزمة منسقة ومنظمة من المقررات الدراسية التي تشتمل على إجراءات وخبرات تنظم بشكل مفردات دراسية الغرض الأساس منها بناء وصقل مهارات الخريجين مما يجعلهم مؤهلين لتلبية متطلبات سوق العمل. يتم مراجعته وتقييمه سنوياً عبر إجراءات وبرامج التدقيق الداخلي أو الخارجي مثل برنامج الممتحن الخارجي.

يقدم وصف البرنامج الأكاديمي ملخص موجز للسمات الرئيسية للبرنامج ومقرراته مبيناً المهارات التي يتم العمل على اكسابها للطلبة مبنية على وفق اهداف البرنامج الأكاديمي وتتجلى أهمية هذا الوصف لكونه يمثل الحجر الأساس في الحصول على الاعتماد البرامجي ويشترك في كتابته الملاكات التدريسية بإشراف اللجان العلمية في الأقسام العلمية.

ويتضمن هذا الدليل وصفاً للبرنامج الأكاديمي بعد تحديث مفردات وفقرات الدليل في ضوء مستجدات وتطورات النظام التعليمي في العراق والذي تضمن وصف البرنامج الأكاديمي بشكلها التقليدي نظام (فصلي) فضلاً عن اعتماد وصف البرنامج الأكاديمي فيما يخص البرامج التي تعتمد مسار بولونيا أساساً لعملها.

وفي هذا المجال لا يسعنا إلا أن نؤكد على أهمية كتابة وصف البرامج الأكاديمية والمقررات الدراسية لضمان حسن سير العملية التعليمية.

## مفاهيم ومصطلحات:

**وصف البرنامج الأكاديمي:** يوفر وصف البرنامج الأكاديمي إيجازاً مقتضباً لرؤيته ورسالته وأهدافه متضمناً وصفاً دقيقاً لمخرجات التعلم المستهدفة على وفق استراتيجيات تعلم محددة.

**وصف المقرر:** يوفر إيجازاً مقتضباً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنأ عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ويكون مشتق من وصف البرنامج.

**رؤية البرنامج:** صورة طموحة لمستقبل البرنامج الأكاديمي ليكون برنامجاً متطوراً وملهماً ومحفزاً وواقعياً وقابلاً للتطبيق.

**رسالة البرنامج:** توضح الأهداف والأنشطة اللازمة لتحقيقها بشكل موجز كما يحدد مسارات تطور البرنامج واتجاهاته.

**أهداف البرنامج:** هي عبارات تصف ما ينوي البرنامج الأكاديمي تحقيقه خلال فترة زمنية محددة وتكون قابلة للقياس والملاحظة.

**هيكلية المنهج:** كافة المقررات الدراسية / المواد الدراسية التي يتضمنها البرنامج الأكاديمي على وفق نظام التعلم المعتمد (فصلي، مسار بولونيا) مع عدد الوحدات الدراسية.

**مخرجات التعلم:** مجموعة متوافقة من المعارف والمهارات والقيم التي اكتسبها الطالب بعد انتهاء البرنامج الأكاديمي بنجاح ويجب أن يُحدد مخرجات التعلم لكل مقرر بالشكل الذي يحقق أهداف البرنامج.

**استراتيجيات التعليم والتعلم:** بأنها الاستراتيجيات المستخدمة من قبل عضو هيئة التدريس لتطوير تعليم وتعلم الطالب وهي خطط يتم إتباعها للوصول إلى أهداف التعلم. أي تصف جميع الأنشطة الصفية واللاصفية لتحقيق نتائج التعلم للبرنامج.

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## استمارة وصف البرنامج الأكاديمي للكليات والمعاهد للعام الدراسي 2025-2026

الجامعة: شط العرب  
الكلية/المعهد: كلية الهندسة  
القسم العلمي: الهندسة المدنية  
تاريخ ملء الملف: 2025/9/1



التوقيع

اسم المعاون العلمي: د. جواد كاظم  
التاريخ:



التوقيع

اسم رئيس القسم: م. نبيل نجم عبد الله  
التاريخ:



دقق الملف من قبل

شعبة ضمان الجودة والاداء الجامعي

اسم مدير شعبة ضمان الجودة والاداء الجامعي: د. جاسم محسن ياسر

التاريخ:

التوقيع



الدكتور  
جاسم محسن ياسر  
Dr. Jasim Al-Battat



أ.م.د. احسان قاسم محمد  
عميد كلية الهندسة

مصادقة السيد العميد

## نموذج وصف المقرر

### وصف المقرر

يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنأ عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ولا بد من الربط بينها وبين وصف البرنامج.

|                                                                                                                                                                                                                                                                                                                                                                                           |                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 1. المؤسسة التعليمية                                                                                                                                                                                                                                                                                                                                                                      | جامعة شط العرب                                                             |
| 2. القسم العلمي / المركز                                                                                                                                                                                                                                                                                                                                                                  | كلية الهندسة                                                               |
| 3. اسم البرنامج الاكاديمي                                                                                                                                                                                                                                                                                                                                                                 | قسم الهندسة المدنية                                                        |
| 4. الشهادة النهائية                                                                                                                                                                                                                                                                                                                                                                       | بكالوريوس                                                                  |
| 5. النظام الدراسي                                                                                                                                                                                                                                                                                                                                                                         | المرحلة الأولى والثانية والثالثة نظام بولونيا<br>المرحلة الرابعة نظام فصلي |
| 6. برنامج الاعتماد المعتمد                                                                                                                                                                                                                                                                                                                                                                | لم يتم تخرج دفعة لحد الان                                                  |
| 7. تاريخ إعداد هذا الوصف                                                                                                                                                                                                                                                                                                                                                                  | 2025/9/1                                                                   |
| 8. أهداف المقرر                                                                                                                                                                                                                                                                                                                                                                           | يهدف هذا المقرر ضمن برنامج الهندسة المدنية إلى تحقيق الآتي:                |
| 1. التأهيل المعرفي: تزويد الطلبة بالخلفية العلمية والنظرية الحاكمة لتصميم وتحليل وتنفيذ مشاريع البنى التحتية والإنشائية.<br>2. الربط التطبيقي: تمكين الطالب من ربط المفاهيم الرياضية والفيزيائية والجيولوجية بالحلول الهندسية المباشرة في المواقع الإنشائية.<br>3. التأهيل المهني: إكساب الطلبة مهارات التعامل مع محددات التصميم والأكواد الهندسية وحل مشكلات التنفيذ وفحص المواد بكفاءة. |                                                                            |

### 9. مخرجات المقرر وطرائق التعليم والتعلم والتقييم

#### أ- الأهداف المعرفية:

- 1- يستذكر ويشرح النظريات، والمبادئ، والمعادلات الأساسية الحاكمة لتصرف المواد والمنشآت المدنية.
- 2- يحدد ويصنف المتغيرات والمعايير الجيوتقنية والإنشائية ذات العلاقة بالمشكلات التخصصية في الهندسة المدنية.
- 3- يفسر الآليات الفيزيائية والميكانيكية التي تحكم سلوك المواد الهندسية (كالخرسانة، الحديد، التربة، والمياه).
- 4- يستوعب الأكواد والمدونات والمواصفات القياسية (مثل مدونة البناء العراقية، الكود الأمريكي ACI, ASTM) المرتبطة بالتخصص.

#### ب - الأهداف المهاراتية الخاصة بالمقرر:

- ب 1- يمتلك القدرة على نمذجة وصياغة وتحليل العناصر الإنشائية والأنظمة المدنية بأسلوب علمي ومنهجي رصين.
- ب 2- يحلل البيانات الهندسية ويجري الحسابات الرياضية أو الاختبارات المختبرية للمواد بدقة وحسب المواصفات.
- ب 3- يوظف البرمجيات والأدوات التقنية الحديثة المستخدمة في الممارسات المدنية (مثل AutoCAD, STAAD Pro, ETABS) لحل المعضلات التصميمية.

#### ج- الأهداف الوجدانية:

- ج1- يطور التفكير النقدي الهندسي والقدرة على اتخاذ القرارات الميدانية المستندة إلى أسس الأمان المستدام والكلفة الاقتصادية.
- ج2- يلتزم بأخلاقيات مهنة الهندسة المدنية والنزاهة الأكاديمية والمهنية (منع الاستغلال، وتحري الأمانة في الفحوصات المختبرية).
- ج3- يثبت القدرة على العمل بروح الفريق ضمن مجموعات عمل هندسية متعددة التخصصات (إدارة مشاريع، تنفيذ، إشراف).

#### د - المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي):

- د1- يدير الوقت والموارد في المكتب والموقع بفعالية ويلتزم بتسليم المهام والتقارير الفنية في المواعيد المقررة.
- د2- يتواصل هندسيًا بكفاءة عالية (شفهيًا وكتابيًا) من خلال صياغة التقارير الفنية، جداول الكميات، والمخططات التنفيذية.
- د3- يمتلك مهارة التعلم الذاتي والمستمر لمواكبة التطورات المتسارعة في مواد البناء الذكية وتقنيات التشييد الحديثة.

#### 10. طرائق التعليم والتعلم:

- 1- المحاضرات النظرية: عرض المفاهيم والمبادئ والنظريات الأساسية في الهندسة المدنية، مع توظيف أساليب العصف الذهني والمناقشة العلمية والحوار التفاعلي، وربط المفاهيم النظرية بالتطبيقات الهندسية في مشاريع الأبنية والمنشآت والبنى التحتية.

- 2- جلسات التمارين والمختبرات: تنفيذ التمارين والحسابات الهندسية وإجراء التجارب والفحوصات المختبرية المتعلقة بمواد البناء، والخرسانة، والحديد، والتربة، والركام، والمياه، وتحليل النتائج وتفسيرها وفق المواصفات والمعايير الهندسية المعتمدة.
- 3- التعلم القائم على المشاريع: تكليف الطلبة بإعداد مشاريع تطبيقية مصغرة تحاكي المشكلات والعمليات الواقعية في الهندسة المدنية، مثل التحليل والتصميم الإنشائي، وتصميم الطرق، وتحليل التربة والأساسات، وشبكات المياه والصرف الصحي، وإعداد جداول الكميات.
- 4- التعلم باستخدام البرمجيات الهندسية: تدريب الطلبة على استخدام البرمجيات المتخصصة في الهندسة المدنية لتحليل وتصميم المنشآت، وإعداد المخططات والنماذج الهندسية، وتحليل البيانات، مثل AutoCAD و ETABS و STAAD.Pro و Civil 3D، مع تنمية القدرة على تفسير النتائج واتخاذ القرارات الهندسية المناسبة.
- 5- دراسة الحالات التطبيقية: تحليل ودراسة مشكلات وحالات واقعية من مشاريع الأبنية والطرق والجسور والمنشآت والبنى التحتية، وربط المعرفة النظرية بالتطبيقات العملية وتنمية مهارات التفكير الهندسي وحل المشكلات.
- 6- التعلم التعاوني والعمل الجماعي: تنظيم الطلبة ضمن مجموعات عمل لتنفيذ المشاريع والتمارين التطبيقية، بما يعزز مهارات التواصل الهندسي والعمل الجماعي وتحمل المسؤولية المهنية.
- 7- الزيارات العلمية والتدريب الميداني: الاستفادة من الزيارات العلمية والتدريب العملي في مواقع المشاريع الإنشائية ومشاريع البنى التحتية والمختبرات الهندسية، لتعريف الطلبة ببيئة العمل الحقيقية وربط الجانب الأكاديمي بالممارسات المهنية.

طرائق التقييم:

|                             |                            | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|-----------------------------|----------------------------|-------------|------------------|----------|---------------------------|
| <b>Formative assessment</b> | الاختبارات                 | 2           | 10% (10)         |          |                           |
|                             | المهام                     | 2           | 10% (10)         |          |                           |
|                             | المشاريع/المختبر           | 1           | 10% (10)         |          |                           |
|                             | التقرير                    | 1           | 10% (10)         |          |                           |
| <b>Summative assessment</b> | امتحان منتصف الفصل الدراسي | 2hr         | 10% (10)         |          |                           |
|                             | الامتحان النهائي           | 2hr         | 50% (50)         |          |                           |
| <b>Total assessment</b>     |                            |             | 100% (100 Marks) |          |                           |

#### طرائق التقييم:

- التفاعل والمشاركة العلمية داخل المحاضرات.
- الواجبات البيتية والمهام الهندسية.
- التقارير الفنية والمختبرية.
- الاختبارات القصيرة. (Quizzes)
- المشاريع والتطبيقات العملية.
- الامتحانات الفصلية والنهائية.
- تقييم قدرة الطالب على تحليل المشكلات النفطية والغازية وتفسير النتائج الهندسية.

#### 11. بنية البرنامج:

| المرحلة الاولى  |                                    |        |         |         |         |                      |      |                      |                       |                        |                             |
|-----------------|------------------------------------|--------|---------|---------|---------|----------------------|------|----------------------|-----------------------|------------------------|-----------------------------|
| الرمز           | المادة                             | الكورس | الوحدات | النوع   | المرحلة | عدد الساعات الأسبوعي |      | المجموع SSWL(hr/sem) | المجموع USSWL(hr/sem) | ساعات الامتحان النهائي | متطلبات الاعتمادية البرمجية |
|                 |                                    |        |         |         |         | نظري                 | عملي |                      |                       |                        |                             |
| E122-1          | الرياضيات 1                        | الأول  | 5       | Basic   | 1       | 5                    | 0    | 70                   | 53                    | 2                      | ABET                        |
| CE131-1         | الميكانيك الهندسي 1                | الأول  | 6       | Core    | 1       | 6                    | 0    | 84                   | 64                    | 2                      |                             |
| E126            | علم مواد البناء                    | الأول  | 6       | Core    | 1       | 3                    | 3    | 84                   | 64                    | 2                      |                             |
| E115            | الكيمياء                           | الأول  | 3       | Basic   | 1       | 1                    | 2    | 42                   | 31                    | 2                      | ABET                        |
| U111-1          | اللغة الانكليزية I                 | الأول  | 2       | Support | 1       | 2                    | 0    | 28                   | 20                    | 2                      |                             |
| E126            | الديمقراطية وحقوق الانسان          | الأول  | 2       | Basic   | 1       | 2                    | 0    | 28                   | 20                    | 2                      |                             |
| CE116           | علم الأرض                          | الأول  | 6       | Basic   | 1       | 3                    | 3    | 84                   | 64                    | 2                      |                             |
| المجموع         |                                    |        |         |         |         |                      |      |                      |                       |                        |                             |
| E122-2          | الرياضيات 2                        | الثاني | 5       | Basic   | 1       | 5                    | 0    | 70                   | 53                    | 2                      | ABET                        |
| CE131-2         | الميكانيك الهندسي 2                | الثاني | 6       | Core    | 1       | 6                    | 0    | 84                   | 64                    | 2                      |                             |
| CE118           | الرسم الهندسي                      | الثاني | 8       | Core    | 1       | 8                    | 0    | 112                  | 86                    | 2                      |                             |
| E125            | علم الحاسوب I                      | الثاني | 3       | Basic   | 1       | 1                    | 2    | 42                   | 31                    | 2                      |                             |
| E116            | الورش الهندسية                     | الثاني | 3       | Support | 1       | 1                    | 2    | 42                   | 31                    | 2                      | ABET                        |
| E128            | الفيزياء                           | الثاني | 3       | Basic   | 1       | 1                    | 2    | 42                   | 31                    | 2                      |                             |
| U121            | اللغة العربية I                    | الثاني | 2       | Support | 1       | 2                    | 0    | 28                   | 20                    | 2                      |                             |
| المجموع         |                                    |        |         |         |         |                      |      |                      |                       |                        |                             |
| المرحلة الثانية |                                    |        |         |         |         |                      |      |                      |                       |                        |                             |
| الرمز           | المادة                             | الكورس | الوحدات | النوع   | المرحلة | عدد الساعات الأسبوعي |      | المجموع SSWL(hr/sem) | المجموع USSWL(hr/sem) | ساعات الامتحان النهائي | متطلبات الاعتمادية البرمجية |
|                 |                                    |        |         |         |         | حضورى                | عملي |                      |                       |                        |                             |
| E212-1          | الرياضيات التطبيقية                | الأول  | 7       | Basic   | 2       | 6                    | 0    | 84                   | 89                    | 2                      | ABET                        |
| CE214-1         | ميكانيك الموائع I                  | الأول  | 5       | Core    | 2       | 3                    | 2    | 70                   | 53                    | 2                      |                             |
| CE213-1         | مقاومة المواد I                    | الأول  | 5       | Core    | 2       | 5                    | 0    | 70                   | 53                    | 2                      |                             |
| CE228           | انشاء المباني                      | الأول  | 3       | Core    | 2       | 2                    | 0    | 28                   | 45                    | 2                      |                             |
| CE217           | علم الحاسوب II                     | الأول  | 3       | Basic   | 2       | 1                    | 2    | 42                   | 31                    | 2                      |                             |
| CE215-1         | المساحة الهندسية I                 | الأول  | 5       | Core    | 2       | 3                    | 2    | 70                   | 53                    | 2                      |                             |
| U221            | اللغة العربية II                   | الأول  | 2       | Support | 2       | 2                    | 0    | 28                   | 20                    | 2                      |                             |
| المجموع         |                                    |        |         |         |         |                      |      |                      |                       |                        |                             |
| CE214-2         | ميكانيك الموائع II                 | الثاني | 5       | Core    | 2       | 3                    | 2    | 70                   | 53                    | 2                      |                             |
| CE213-2         | مقاومة المواد II                   | الثاني | 5       | Core    | 2       | 5                    | 0    | 70                   | 53                    | 2                      |                             |
| CE215-2         | المساحة الهندسية II                | الثاني | 5       | Core    | 2       | 3                    | 2    | 70                   | 53                    | 2                      |                             |
| CE227           | الإحصاء                            | الثاني | 4       | Basic   | 2       | 2                    | 0    | 28                   | 70                    | 2                      |                             |
| CE216           | تكنولوجيا الخرسانة                 | الثاني | 7       | Core    | 2       | 3                    | 4    | 98                   | 75                    | 2                      |                             |
| U212            | جرائم حزب البعث                    | الثاني | 2       | Support | 2       | 2                    | 0    | 28                   | 20                    | 2                      |                             |
| U211-2          | اللغة الإنكليزية II                | الثاني | 2       | Support | 2       | 2                    | 0    | 28                   | 2                     | 30                     |                             |
| المجموع         |                                    |        |         |         |         |                      |      |                      |                       |                        |                             |
| المرحلة الثالثة |                                    |        |         |         |         |                      |      |                      |                       |                        |                             |
| الرمز           | المادة                             | الكورس | الوحدات | النوع   | المرحلة | عدد الساعات الأسبوعي |      | المجموع SSWL(hr/sem) | المجموع USSWL(hr/sem) | ساعات الامتحان النهائي | متطلبات الاعتمادية البرمجية |
|                 |                                    |        |         |         |         | نظري                 | عملي |                      |                       |                        |                             |
| CE311-1         | التحليلات الهندسية                 | الأول  | 5       | Core    | 3       | 5                    | 0    | 70                   | 53                    | 2                      | ABET                        |
| CE312-1         | نظرية الانشاءات I                  | الأول  | 6       | Core    | 3       | 6                    | 0    | 84                   | 64                    | 2                      |                             |
| CE314-1         | تصاميم الخرسانة المسلحة I          | الأول  | 6       | Core    | 3       | 6                    | 0    | 84                   | 64                    | 2                      |                             |
| CE313-1         | ميكانيك التربة I                   | الأول  | 5       | Core    | 3       | 3                    | 2    | 70                   | 53                    | 2                      |                             |
| CE315-1         | هندسة الري                         | الأول  | 4       | Core    | 3       | 4                    | 0    | 56                   | 42                    | 2                      |                             |
| CE316           | إدارة مشاريع                       | الأول  | 4       | Core    | 3       | 4                    | 0    | 56                   | 42                    | 2                      |                             |
| المجموع         |                                    |        |         |         |         |                      |      |                      |                       |                        |                             |
| CE311-2         | التحليل العددي والتطبيقات الهندسية | الثاني | 5       | Core    | 3       | 2                    | 3    | 70                   | 53                    | 2                      | ABET                        |
| CE312-2         | نظرية الانشاءات II                 | الثاني | 6       | Core    | 3       | 6                    | 0    | 84                   | 64                    | 2                      |                             |
| CE314-2         | تصاميم الخرسانة المسلحة II         | الثاني | 6       | Core    | 3       | 6                    | 0    | 84                   | 64                    | 2                      |                             |
| CE313-2         | ميكانيك التربة II                  | الثاني | 5       | Core    | 3       | 3                    | 2    | 70                   | 53                    | 2                      |                             |
| CE317           | هندسة المرور والمواصلات            | الثاني | 4       | Core    | 3       | 2                    | 2    | 56                   | 42                    | 2                      |                             |
| CE315-2         | هندسة البزل                        | الثاني | 4       | Core    | 3       | 4                    | 0    | 56                   | 42                    | 2                      |                             |
| المجموع         |                                    |        |         |         |         |                      |      |                      |                       |                        |                             |
| المرحلة الرابعة |                                    |        |         |         |         |                      |      |                      |                       |                        |                             |
| الرمز           | المادة                             | الكورس | الوحدات | النوع   | المرحلة | عدد الساعات الأسبوعي |      | المجموع SSWL(hr/sem) | المجموع USSWL(hr/sem) | ساعات الامتحان النهائي | متطلبات الاعتمادية البرمجية |
|                 |                                    |        |         |         |         | نظري                 | عملي |                      |                       |                        |                             |
| CE411           | تصاميم خرسانية                     | الأول  | 6       | Core    | 4       | 6                    | 0    | 84                   | 64                    | 2                      |                             |
| CE412-1         | هندسة الاسس I                      | الأول  | 6       | Core    | 4       | 6                    | 0    | 84                   | 64                    | 2                      |                             |
| CE416-1         | امدادات المياه                     | الأول  | 5       | Core    | 4       | 3                    | 2    | 70                   | 53                    | 2                      |                             |
| CE417           | طرق الانشاء والتخمين               | الأول  | 5       | Core    | 4       | 5                    | 0    | 70                   | 53                    | 2                      |                             |
| CE418           | الهيدرولوجيا الهندسية              | الأول  | 4       | Core    | 4       | 4                    | 0    | 56                   | 42                    | 2                      |                             |
| CE413-1         | تصاميم الحديد I                    | الأول  | 4       | Core    | 4       | 4                    | 0    | 56                   | 42                    | 2                      |                             |
| المجموع         |                                    |        |         |         |         |                      |      |                      |                       |                        |                             |
| CE412-2         | هندسة الاسس II                     | الثاني | 6       | Core    | 4       | 6                    | 0    | 84                   | 64                    | 2                      |                             |
| CE414           | منشآت هيدروليكية                   | الثاني | 5       | Core    | 4       | 5                    | 0    | 70                   | 53                    | 2                      |                             |
| CE416-2         | هندسة الصرف الصحي                  | الثاني | 5       | Core    | 4       | 3                    | 2    | 70                   | 53                    | 2                      |                             |
| CE415           | هندسة الطرق                        | الثاني | 6       | Core    | 4       | 4                    | 2    | 84                   | 64                    | 2                      |                             |
| CE420           | المشروع الهندسي و اخلاقيات هندسية  | الثاني | 4       | Core    | 4       | 4                    | 0    | 56                   | 42                    | 2                      |                             |
| CE413-2         | تصاميم الحديد II                   | الثاني | 4       | Core    | 4       | 4                    | 0    | 56                   | 42                    | 2                      |                             |
| المجموع         |                                    |        |         |         |         |                      |      |                      |                       |                        |                             |

## 12. تخطيط التطوير الشخصي:

- 1-التعليم الالكتروني- .
- 2-استخدام وسائل الشبكة العنكبوتية والانترنت- .
- 3-استخدام وسائل الاتصال الحديثة.

### 13. معيار القبول (وضع الأنظمة المتعلقة بالالتحاق بالكلية أو المعهد) :

1-القبول المركزي.

2-معدل الطالب ضمن قوائم القبول المركزي حيث يتم قبولهم حسب (الرغبة) لتوزيعهم على الأقسام.

### 14. موقع الجامعة:

<https://www.sa-uc.edu.iq>

جامعة شط العرب

### 15. خطة تطوير المقرر الدراسي:

- المواءمة مع سوق العمل: مراجعة محتوى المحاضرات والتمارين دورياً لربطها بمتطلبات الشركات الإنشائية ومشاريع البنى التحتية القائمة في العراق.
- التحول الرقمي: تكتيف إدخال برمجيات النمذجة وبرامج التحليل الإنشائي والجيوتقني لتقليل الاعتماد على الحلول اليدوية التقليدية فقط.
- تطوير البيئة المختبرية: تحديث تقارير الفحوصات المختبرية لتعكس المواصفات القياسية العراقية والأمريكية المحدثة، واستخدام التغذية الراجعة من استبيانات الطلبة لتطوير أداء التدريس.

### مخطط مهارات المنهج للعام الدراسي 2025-2026

وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرامج الخاضعة للتقييم

#### مخرجات التعلم المطلوبة من البرامج

| المرحلة الدراسية | اسم المقرر                | نوع المقرر | الأهداف المعرفية |    |    |    | الأهداف المهاراتية الخاصة بالبرنامج |    |    | الأهداف الوجدانية والقيمية |    |    | المهارات العامة والتأهيلية المنقولة (أو) المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي |    |    |
|------------------|---------------------------|------------|------------------|----|----|----|-------------------------------------|----|----|----------------------------|----|----|--------------------------------------------------------------------------------------------------|----|----|
|                  |                           |            | 1أ               | 2أ | 3أ | 4أ | 1ب                                  | 2ب | 3ب | 1ج                         | 2ج | 3ج | 1د                                                                                               | 2د | 3د |
| الاولى           | الرياضيات 1               | Basic      | √                | √  | √  |    |                                     |    | √  | √                          | √  |    |                                                                                                  | √  | √  |
|                  | الميكانيك الهندسي 1       | Core       | √                |    | √  | √  | √                                   | √  |    |                            | √  | √  | √                                                                                                | √  | √  |
|                  | علم مواد البناء           | Core       |                  | √  | √  | √  | √                                   | √  | √  | √                          | √  |    |                                                                                                  | √  | √  |
|                  | الكيمياء                  | Basic      | √                |    |    | √  | √                                   | √  | √  | √                          | √  | √  | √                                                                                                | √  | √  |
|                  | اللغة الانكليزية I        | Support    | √                | √  | √  |    |                                     |    |    | √                          | √  |    |                                                                                                  | √  | √  |
|                  | الديمقراطية وحقوق الانسان | Basic      | √                | √  | √  | √  |                                     |    | √  | √                          | √  | √  | √                                                                                                | √  | √  |
|                  | علم الأرض                 | Basic      | √                | √  | √  | √  | √                                   | √  |    | √                          | √  | √  | √                                                                                                | √  | √  |
|                  | الرياضيات 2               | Basic      | √                | √  |    |    | √                                   | √  | √  | √                          | √  |    |                                                                                                  | √  | √  |
|                  | الميكانيك الهندسي 2       | Core       | √                | √  |    |    | √                                   | √  | √  | √                          | √  |    |                                                                                                  | √  | √  |
|                  | الرسم الهندسي             | Core       | √                | √  | √  | √  | √                                   |    |    | √                          | √  | √  | √                                                                                                | √  | √  |
|                  | علم الحاسوب I             | Basic      | √                | √  | √  | √  | √                                   |    |    | √                          | √  | √  | √                                                                                                | √  | √  |
|                  | الورش الهندسية            | Support    | √                |    |    | √  | √                                   | √  |    |                            | √  | √  | √                                                                                                |    |    |
|                  | الفيزياء                  | Basic      | √                | √  | √  |    |                                     |    | √  | √                          | √  | √  | √                                                                                                | √  | √  |
|                  | اللغة العربية I           | Support    | √                |    |    | √  | √                                   | √  | √  |                            |    | √  | √                                                                                                |    | √  |

|   |   |   |   |   |   |   |   |   |   |   |   |   |         |                                    |         |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---------|------------------------------------|---------|
| √ | √ | √ | √ |   |   | √ | √ | √ | √ | √ |   |   | Basic   | الرياضيات التطبيقية                | الثانية |
| √ |   |   | √ | √ | √ | √ |   |   | √ | √ | √ | √ | Core    | ميكانيك المواع I                   |         |
| √ | √ | √ |   |   | √ | √ | √ | √ | √ | √ |   |   | Core    | مقاومة المواد I                    |         |
| √ | √ | √ | √ | √ | √ |   |   | √ | √ | √ | √ | √ | Core    | انشاء المباني                      |         |
| √ |   |   | √ | √ | √ | √ | √ | √ | √ |   |   | √ | Basic   | علم الحاسوب II                     |         |
| √ | √ | √ | √ | √ | √ |   |   | √ | √ | √ | √ | √ | Core    | المساحة الهندسية I                 |         |
| √ | √ |   |   | √ | √ | √ | √ | √ |   |   | √ | √ | Support | اللغة العربية II                   |         |
| √ |   |   | √ | √ | √ | √ | √ |   |   | √ | √ | √ | Core    | ميكانيك المواع II                  |         |
| √ | √ | √ | √ | √ | √ |   |   | √ | √ | √ | √ | √ | Core    | مقاومة المواد II                   |         |
| √ | √ | √ |   |   | √ | √ | √ | √ | √ | √ |   |   | Core    | المساحة الهندسية II                |         |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | Basic   | الإحصاء                            | الثالثة |
|   | √ | √ | √ |   |   | √ | √ | √ |   |   | √ | √ | Core    | تكنولوجيا الخرسانة                 |         |
| √ |   | √ | √ | √ | √ | √ |   | √ | √ | √ | √ |   | Support | جرائم حزب البعث                    |         |
| √ |   |   | √ | √ | √ |   |   | √ | √ | √ |   | √ | Support | اللغة الإنكليزية II                |         |
| √ | √ | √ |   | √ | √ | √ | √ | √ |   |   | √ | √ | Core    | التحليلات الهندسية                 |         |
| √ | √ |   |   | √ | √ | √ |   |   | √ | √ | √ | √ | Core    | نظرية الانشاءات I                  |         |
| √ | √ | √ | √ |   | √ | √ | √ | √ | √ | √ |   |   | Core    | تصاميم الخرسانة المسلحة I          |         |
| √ | √ | √ |   |   | √ | √ | √ | √ | √ |   |   | √ | Core    | ميكانيك التربة I                   |         |
| √ |   | √ | √ | √ | √ | √ |   |   | √ | √ |   | √ | Core    | هندسة الري                         |         |
| √ | √ |   |   |   | √ | √ | √ | √ | √ | √ | √ | √ | Core    | إدارة مشاريع                       |         |
| √ | √ | √ | √ |   |   | √ | √ | √ | √ |   |   | √ | Core    | التحليل العددي والتطبيقات الهندسية | الرابعة |
| √ | √ |   |   | √ | √ | √ | √ | √ |   |   | √ | √ | Core    | نظرية الانشاءات II                 |         |
| √ | √ | √ | √ | √ | √ |   |   | √ | √ | √ | √ | √ | Core    | تصاميم الخرسانة المسلحة II         |         |
| √ | √ |   |   | √ | √ | √ |   | √ | √ | √ | √ | √ | Core    | ميكانيك التربة II                  |         |
|   |   | √ | √ | √ | √ | √ | √ | √ | √ |   |   |   | Core    | هندسة المرور والموصلات             |         |
| √ | √ | √ | √ |   |   | √ | √ | √ | √ | √ |   | √ | Core    | هندسة البزل                        |         |
| √ | √ | √ | √ | √ |   | √ |   | √ | √ | √ | √ | √ | Core    | تصاميم خرسانية                     |         |
| √ | √ | √ |   | √ | √ | √ |   | √ | √ |   | √ | √ | Core    | هندسة الاسس I                      |         |
| √ | √ | √ |   | √ | √ | √ | √ | √ |   | √ | √ | √ | Core    | امدادات المياه                     |         |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |   | √ | √ | Core    | طرق الانشاء والتخمين               |         |
| √ | √ | √ |   | √ | √ | √ | √ | √ |   | √ | √ | √ | Core    | الهيدرولوجيا الهندسية              |         |
| √ | √ | √ | √ | √ |   |   | √ | √ | √ | √ | √ | √ | Core    | تصاميم الحديد I                    |         |
| √ |   |   | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | Core    | هندسة الاسس II                     |         |

|   |   |   |   |   |   |   |   |   |   |   |   |   |      |                                      |
|---|---|---|---|---|---|---|---|---|---|---|---|---|------|--------------------------------------|
| √ | √ | √ | √ | √ |   |   | √ | √ | √ |   |   | √ | Core | منشآت<br>هيدروليكية                  |
| √ |   |   | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | Core | هندسة الصرف<br>الصحي                 |
| √ | √ | √ |   | √ | √ | √ |   |   | √ | √ | √ | √ | Core | هندسة الطرق                          |
| √ | √ | √ | √ |   |   | √ | √ | √ |   | √ | √ | √ | Core | المشروع الهندسي و<br>اخلاقيات هندسية |
| √ |   | √ | √ |   | √ | √ |   | √ | √ |   | √ | √ | Core | تصاميم الحديد II                     |

# وصف المقررات

العداد

وحدة ضمان الجودة

كلية الهندسة - قسم الهندسة المدنية

## نماذج وصف المواد الدراسية-المرحلة الأولى-قسم الهندسة المدنية

| Module Information                 |                         |                      |                                                                                                                                                                                                                                                     |
|------------------------------------|-------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                         |                      |                                                                                                                                                                                                                                                     |
| Module Title                       | <b>Computer Science</b> |                      | Module Delivery                                                                                                                                                                                                                                     |
| Module Type                        | <b>Basic</b>            |                      | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input checked="" type="checkbox"/> Seminar |
| Module Code                        | <b>E125</b>             |                      |                                                                                                                                                                                                                                                     |
| ECTS Credits                       | 6                       |                      |                                                                                                                                                                                                                                                     |
| SWL (hr/sem)                       | 75                      |                      |                                                                                                                                                                                                                                                     |
| Module Level                       | 1                       | Semester of Delivery |                                                                                                                                                                                                                                                     |
| Administering Department           | Type Dept. Code         | College              | Type College Code                                                                                                                                                                                                                                   |
| Module Leader                      |                         |                      | e-mail                                                                                                                                                                                                                                              |
| Module Leader's Acad. Title        |                         |                      | Module Leader's Qualification                                                                                                                                                                                                                       |
| Module Tutor                       |                         |                      | e-mail                                                                                                                                                                                                                                              |
| Peer Reviewer Name                 | None                    | e-mail               | None                                                                                                                                                                                                                                                |
| Scientific Committee Approval Date | 01/09/2025              | Version Number       | 1.0                                                                                                                                                                                                                                                 |

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

| Module Aims, Learning Outcomes and Indicative Contents           |                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية         |                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | <ul style="list-style-type: none"> <li>To knowledge of the most important components and basics of a computer</li> <li>To understand algorithms and flowcharts</li> <li>To learn how to use computer software (Word, Excel, and Power point)</li> </ul>                                                                                                                                 |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <ul style="list-style-type: none"> <li>Knowledge of computer basics</li> <li>Building an integrated algorithm for any program</li> <li>Draw a flowchart for any program</li> <li>Using Word and creating a Word file</li> <li>Drawing charts using Excel</li> <li>Perform all calculations and obtain results using Excel</li> <li>Preparing a presentation using PowerPoint</li> </ul> |

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 58  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 42  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 2.8 |
| <b>Total SWL (h/sem)</b><br>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 |                           |
|                       | 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 computer                           |
| Week 2                          | Computer programming language                      |
| Week 3                          | Flowcharts                                         |
| Week 4                          | Algorithms                                         |
| Week 5                          | Introduction to Microsoft word                     |
| Week 6                          | Word Tutorial                                      |
| Week 7                          | Word Tutorial                                      |
| Week 8                          | Introduction to Microsoft excel                    |
| Week 9                          | Find solutions for various mathematical operations |
| Week 10                         | How to insert different functions using Excel      |
| Week 11                         | Draw charts using Excel                            |
| Week 12                         | Introduction to power point                        |
| Week 13                         | prepare a presentation using Power point           |
| Week 14                         | Seminar                                            |

|                |                                        |
|----------------|----------------------------------------|
| <b>Week 15</b> | Seminar                                |
| <b>Week 16</b> | Preparatory week before the final Exam |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                                                                                                |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|                                                                         | Material Covered                                                                                               |
| <b>Week 1</b>                                                           | Learning about computer parts and important tasks in Windows                                                   |
| <b>Week 2</b>                                                           | Learning the basics of the Word software by controlling the type, size and color of the font and other setting |
| <b>Week 3</b>                                                           | Learning how to insert an image, chart, text, etc                                                              |
| <b>Week 4</b>                                                           | Learning the basics of the Excel and how to find the solutions for different equations                         |
| <b>Week 5</b>                                                           | Learn drawing different charts                                                                                 |
| <b>Week 6</b>                                                           | Learning the basics for power point                                                                            |
| <b>Week 7</b>                                                           | Learning how to prepare a presentation using Power point                                                       |

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                                                                                                             |                           |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                                 | Text                                                                                                                        | Available in the Library? |
| <b>Required Texts</b>                                           | Microsoft Word 2016 Step by Step<br>An introduction to EXCEL for civil Engineers<br>Microsoft Power Point 2016 Step by Step | No                        |
| <b>Recommended Texts</b>                                        |                                                                                                                             | No                        |
| <b>Websites</b>                                                 |                                                                                                                             |                           |

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

| Module Information                 |                                   |                 |                                                                                                                                                                                                                               |                   |   |
|------------------------------------|-----------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---|
| معلومات المادة الدراسية            |                                   |                 |                                                                                                                                                                                                                               |                   |   |
| Module Title                       | <b>Human rights and democracy</b> |                 | Module Delivery                                                                                                                                                                                                               |                   |   |
| Module Type                        | Supportive                        |                 | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                   |   |
| Module Code                        | <b>E126</b>                       |                 |                                                                                                                                                                                                                               |                   |   |
| ECTS Credits                       | 4                                 |                 |                                                                                                                                                                                                                               |                   |   |
| SWL (hr/sem)                       | <b>60</b>                         |                 |                                                                                                                                                                                                                               |                   |   |
| Module Level                       |                                   | 1               | Semester of Delivery                                                                                                                                                                                                          |                   | 1 |
| Administering Department           |                                   | Type Dept. Code | College                                                                                                                                                                                                                       | Type College Code |   |
| Module Leader                      |                                   |                 | e-mail                                                                                                                                                                                                                        |                   |   |
| Module Leader's Acad. Title        |                                   |                 | Module Leader's Qualification                                                                                                                                                                                                 |                   |   |
| Module Tutor                       | None                              |                 | e-mail                                                                                                                                                                                                                        | None              |   |
| Peer Reviewer Name                 |                                   | None            | e-mail                                                                                                                                                                                                                        | None              |   |
| Scientific Committee Approval Date |                                   | 01/09/2025      | Version Number                                                                                                                                                                                                                | 1.0               |   |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                          |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                          |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | 1-Introducing students to the basic principles of human rights and clarifying those rights according to various sources.<br>2-Addressing the basic concepts of democracy and its historical development. |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | 1- Educating the student on the principles and laws related to the subject of human rights.<br>2 -Teaching students the foundations upon which human rights and the democratic system are built.<br>3- Developing the necessary skills to deal with the democratic system.<br>4- The student acquainted with the constitutional rights in the Iraqi Law |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | Universal Declaration of Human Rights                                                                                                                                                                                                                                                                                                                   |

| Student Workload (SWL)                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |     |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |     |
| Structured SWL (h/sem)                      | 58                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Structured SWL (h/w)                     | 4   |
| الحمل الدراسي المنتظم للطالب خلال الفصل     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | الحمل الدراسي المنتظم للطالب أسبوعيا     |     |
| Unstructured SWL (h/sem)                    | 42                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Unstructured SWL (h/w)                   | 2.8 |
| الحمل الدراسي غير المنتظم للطالب خلال الفصل |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | الحمل الدراسي غير المنتظم للطالب أسبوعيا |     |
| Total SWL (h/sem)                           | 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                          |     |
| الحمل الدراسي الكلي للطالب خلال الفصل       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |     |
| Learning and Teaching Strategies            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |     |
| استراتيجيات التعلم والتعليم                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |     |
| Strategies                                  | <ul style="list-style-type: none"><li>• Teaching and learning strategies of Human rights and democracy of whole class, group of five students and individual activities and jobs to examine abilities, skills and learning.</li><li>• Learn about most of the ideas and theories related to the systems of political governance and the way of looking at the issue of human rights and democratic behavior</li><li>• How to preserve the right of opposition constitutionally.</li><li>• Preserving the rights of minorities in society</li><li>• Manage discussions on topics related to the curriculum</li><li>• method of democratic dialogue</li></ul> |                                          |     |
|                                             | Respect the different opinions on the chosen topics.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                          |     |

| Module Evaluation     |              |             |                  |          |                           |
|-----------------------|--------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية |              |             |                  |          |                           |
|                       |              | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment  | Quizzes      | 2           | 10% (10)         | 4,14     | LO #1-3, 8-12             |
|                       | Assignments  | 2           | 20% (20)         | 8,15     | LO # 5-6, 13-14           |
|                       | Report       | 1           | 10% (10)         | 12       | LO # 1-8                  |
| Summative assessment  | Midterm Exam | 2 hr        | 10% (10)         | 10       | LO # 1-8                  |
|                       | Final Exam   | 2hr         | 50% (50)         | 16       | All                       |
| Total assessment      |              |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                                                                                                                  |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                                                                                                                                                  |
|                                 | Material Covered                                                                                                                                                                 |
| Week 1                          | The historical development of human rights throughout history                                                                                                                    |
| Week 2                          | Human rights in the Christian and Jewish religions                                                                                                                               |
| Week 3                          | Human rights in Islam                                                                                                                                                            |
| Week 4                          | Women's rights in ancient civilizations and Islam                                                                                                                                |
| Week 5                          | Universal Declaration of Human Rights                                                                                                                                            |
| Week 6                          | National Human Rights Resources                                                                                                                                                  |
| Week 7                          | Human rights in the constitution of the Republic of Iraq for the year 2005                                                                                                       |
| Week 8                          | Human rights and citizenship                                                                                                                                                     |
| Week 9                          | Definition of democracy - historical development - characteristics - types of authorities - Islam and Democracy                                                                  |
| Week 10                         | Defining freedom linguistically and idiomatically - Sources of freedom - Freedom in the West - Individual and public freedom in Islam - Economic, labor and intellectual freedom |
| Week 11                         | Political and civil rights in the democratic system                                                                                                                              |
| Week 12                         | characteristics of the democratic system                                                                                                                                         |
| Week 13                         | Democratic guarantees - types of guarantees - constitutional guarantees - judicial guarantees - political guarantees - combating organized corruption                            |
| Week 14                         | Elections systems                                                                                                                                                                |
| Week 15                         | Types of democratic systems                                                                                                                                                      |
| Week 16                         | Preparatory week before the final Exam                                                                                                                                           |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                                                                                                                                                                                           | Available in the Library? |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Required Texts    | Human rights, children and democracy for the Ministry of Education Human rights and children and democracy for the Ministry of Higher Education and Scientific Research - University of Tikrit | Yes                       |
| Recommended Texts | Curriculum lectures                                                                                                                                                                            | No                        |
| Websites          |                                                                                                                                                                                                |                           |

| Module Information                 |                             |                      |                                                                                                                                                                                                                               |
|------------------------------------|-----------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                             |                      |                                                                                                                                                                                                                               |
| Module Title                       | <b>Engineering workshop</b> |                      | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | Supported                   |                      | <input type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>E116</b>                 |                      |                                                                                                                                                                                                                               |
| ECTS Credits                       | 4                           |                      |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | <b>60</b>                   |                      |                                                                                                                                                                                                                               |
| Module Level                       | 1                           | Semester of Delivery |                                                                                                                                                                                                                               |
| Administering Department           | Type Dept. Code             | College              | Type College Code                                                                                                                                                                                                             |
| Module Leader                      |                             |                      | e-mail                                                                                                                                                                                                                        |
| Module Leader's Acad. Title        |                             |                      | Module Leader's Qualification                                                                                                                                                                                                 |
| Module Tutor                       |                             |                      | e-mail                                                                                                                                                                                                                        |
| Peer Reviewer Name                 | Name                        | e-mail               | E-mail                                                                                                                                                                                                                        |
| Scientific Committee Approval Date | 01/09/2025                  | Version Number       | 1.0                                                                                                                                                                                                                           |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                           |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                           |
| Module Aims<br>أهداف المادة الدراسية                     | <ul style="list-style-type: none"> <li>Educating and training students in workshops on practical activities related to the field application at the workplace.</li> </ul> |

|                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                        | <ul style="list-style-type: none"> <li>Conveying the fundamental principles of using machinery and equipment in engineering workshops and teaching them to students.</li> </ul>                                                                                                                                                                                                                                                                                                                |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية   | <ul style="list-style-type: none"> <li>Teaching students the fundamental principles of using machinery and equipment in engineering workshops and how to operate them safely.</li> <li>Educating and training students on the practical aspects of various types of engineering workshops.</li> <li>Developing the necessary skills to handle tools, instruments, and machinery in engineering workshops, along with preparing reports on the usage and benefits of this equipment.</li> </ul> |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Strategies</b>                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 58  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 42  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 2.8 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                        |             |                  |          |                           |
|---------------------------------------------------|------------------------|-------------|------------------|----------|---------------------------|
|                                                   |                        | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | <b>Quizzes</b>         | 2           | 10% (10)         |          |                           |
|                                                   | <b>Assignments</b>     | 2           | 10% (10)         |          |                           |
|                                                   | <b>Projects / Lab.</b> | 1           | 10% (10)         |          |                           |
|                                                   | <b>Report</b>          | 1           | 10% (10)         |          |                           |
| <b>Summative assessment</b>                       | Midterm Exam           | 2 hr        | 10% (10)         |          |                           |
|                                                   | Final Exam             | 2hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>                           |                        |             | 100% (100 Marks) |          |                           |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

|         | Material Covered                           |
|---------|--------------------------------------------|
| Week 1  | ورشة النجارة (Carpentry Workshop)          |
| Week 2  | ورشة النجارة (Carpentry Workshop)          |
| Week 3  | ورشة النجارة (Carpentry Workshop)          |
| Week 4  | ورشة اللحام (Welding Workshop)             |
| Week 5  | ورشة اللحام (Welding Workshop)             |
| Week 6  | ورشة الخراطة (Turning / Lathe Workshop)    |
| Week 7  | ورشة الخراطة (Turning / Lathe Workshop)    |
| Week 8  | ورشة البرادة (Filing / Benchwork Workshop) |
| Week 9  | ورشة البرادة (Filing / Benchwork Workshop) |
| Week 10 | ورشة السباكة (Foundry / Plumbing Workshop) |
| Week 11 | ورشة السباكة (Foundry / Plumbing Workshop) |
| Week 12 | ورشة الفريزة / الفريزة (Milling Workshop)  |
| Week 13 | ورشة الفريزة / الفريزة (Milling Workshop)  |
| Week 14 | ورشة اللحام (Welding Workshop)             |
| Week 15 | ورشة اللحام (Welding Workshop)             |
| Week 16 | Preparatory week before the final Exam     |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                 | Available in the Library? |
|-------------------|----------------------|---------------------------|
| Required Texts    | Engineering Workshop | Yes                       |
| Recommended Texts |                      | No                        |
| Websites          |                      |                           |

## Grading Scheme

### مخطط الدرجات

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

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

| Module Information                 |                 |                               |                                                                                                                                                                                                                    |
|------------------------------------|-----------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                 |                               |                                                                                                                                                                                                                    |
| Module Title                       | Arabic          |                               | Module Delivery                                                                                                                                                                                                    |
| Module Type                        | Supported       |                               | <input type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | 216 AL          |                               |                                                                                                                                                                                                                    |
| ECTS Credits                       | 2               |                               |                                                                                                                                                                                                                    |
| SWL (hr/sem)                       | 30              |                               |                                                                                                                                                                                                                    |
| Module Level                       | 1               | Semester of Delivery          | 2                                                                                                                                                                                                                  |
| Administering Department           | Type Dept. Code | College                       | Type College Code                                                                                                                                                                                                  |
| Module Leader                      | Ali Saad        | e-mail                        |                                                                                                                                                                                                                    |
| Module Leader's Acad. Title        | Ass. Lecture    | Module Leader's Qualification | MSc                                                                                                                                                                                                                |
| Module Tutor                       |                 | e-mail                        | E-mail                                                                                                                                                                                                             |
| Peer Reviewer Name                 | Name            | e-mail                        | E-mail                                                                                                                                                                                                             |
| Scientific Committee Approval Date | 01/09/2025      | Version Number                | 1.0                                                                                                                                                                                                                |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                   |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                   |
| Module Aims<br>أهداف المادة الدراسية                     | 1- Educating students about the nature of linguistics and assisting them in correct expression.<br>2- Regulating language styles and uncovering its secrets.<br>3- Equipping students with linguistic abilities that enable them to correct their |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | <p>speech while reading.</p> <p>4- Developing students' linguistic, grammatical, and spelling skills.</p> <p>5- Understanding sentence structures and their different styles.</p> <p>6- Correcting mistakes arising from linguistic errors in pronunciation or writing.</p> <p>7- Introducing punctuation marks and how to use them.</p>                                                                               |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | <p>1- Establish a solid foundation in knowledge and linguistic thought for students in scientific disciplines, both human and scientific.</p> <p>2- Maintain the integrity of the Arabic language.</p> <p>3- Evaluate the language of researchers in preparing master's theses and doctoral dissertations, as well as the language of book authorship in accordance with the correct rules of the Arabic language.</p> |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                |                                                                                                                                                                                                                                                                                                                                                                                                                        |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>1-Conduct linguistic research that serves the language of the Holy Quran and legal arguments as a living means of expressing ideas.</p> <p>2-Train the mind in scientific analysis, which is part of the levels of thinking.</p> <p>3-Use multiple teaching methods to equip students with the ability to grasp the curriculum.</p> <p>4- Develop the student's ability to choose topics that address contemporary intellectual problems.</p> |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعاً      |     |                                                                            |     |
|--------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 58  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعياً       | 4   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 42  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعياً | 2.8 |
| <b>Total SWL (h/sem)</b><br>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)         |          |                           |
|                       | Assignments  | 8           | 20% (20)         |          |                           |
|                       | Seminar      | 1           | 10% (10)         |          |                           |
| Summative assessment  | Midterm Exam | 2 hr        | 10% (10)         |          |                           |
|                       | Final Exam   | 2hr         | 50% (50)         | 16       | All                       |
| Total assessment      |              |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                        |
|---------------------------------|------------------------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                                        |
|                                 | Material Covered                                                       |
| Week 1                          | The Arabic language and its position in global linguistics             |
| Week 2                          | Speech and its components Categories of speech                         |
| Week 3                          | Noun - Signs of the noun                                               |
| Week 4                          | Verb - Signs of the verb                                               |
| Week 5                          | Part - Signs of the part                                               |
| Week 6                          | Spelling and writing rules: Origins and development                    |
| Week 7                          | Spelling rules and written expression: Origin and development          |
| Week 8                          | Rules for controlling the initial hamzah: 1- The hamzah of connection. |
| Week 9                          | 2- Hamzat al-Qat' 3- Hamzat al-Estifham                                |
| Week 10                         | Rules for controlling the medial hamza                                 |
| Week 11                         | Rules for controlling the extreme                                      |
| Week 12                         | Rules for controlling the letter 'Alif'                                |
| Week 13                         | Punctuation Marks - History - Origin and Development                   |
| Week 14                         | Modern punctuation marks                                               |
| Week 15                         | Review                                                                 |
| Week 16                         | Preparatory week before the final Exam                                 |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                                                        | Available in the Library? |
|-------------------|-------------------------------------------------------------|---------------------------|
| Required Texts    | Lectures and handouts                                       | No                        |
| Recommended Texts | Books on linguistics, grammar, and orthographic conventions | Yes                       |
| Websites          |                                                             |                           |

## Grading Scheme

مخطط الدرجات

| Group                       | Grade            | التقدير             | Marks (%) | Definition                            |
|-----------------------------|------------------|---------------------|-----------|---------------------------------------|
| Success Group<br>(50 - 100) | A - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                             | B - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                             | C - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                             | D - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                             | E - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)      | FX – Fail        | راسب (فقد 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 Information                 |                             |                               |                                                                                                                                                                             |
|------------------------------------|-----------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                             |                               |                                                                                                                                                                             |
| Module Title                       | <b>Engineering Drawings</b> |                               | Module Delivery                                                                                                                                                             |
| Module Type                        | Core                        |                               | Theory<br>Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>E118</b>                 |                               |                                                                                                                                                                             |
| ECTS Credits                       | 8                           |                               |                                                                                                                                                                             |
| SWL (hr/sem)                       | 120                         |                               |                                                                                                                                                                             |
| Module Level                       | 1                           | Semester of Delivery          | 2                                                                                                                                                                           |
| Administering Department           | Type Dept. Code             | College                       | Type College Code                                                                                                                                                           |
| Module Leader                      |                             | e-mail                        |                                                                                                                                                                             |
| Module Leader's Acad. Title        | Lecturer                    | Module Leader's Qualification | .                                                                                                                                                                           |
| Module Tutor                       |                             | e-mail                        | E-mail                                                                                                                                                                      |
| Peer Reviewer Name                 | Name                        | e-mail                        | E-mail                                                                                                                                                                      |
| Scientific Committee Approval Date | 01/09/2025                  | Version Number                | 1.0                                                                                                                                                                         |

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

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

|                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Aims</b><br/>أهداف المادة الدراسية</p>                      | <ol style="list-style-type: none"> <li>1. To enable the students to identify the tools/instrument needed.</li> <li>2. To familiarize the student, with the proper techniques, manipulation, uses, and care of the drawing instruments.</li> <li>3. To introduce the students to a specific language of engineers which is a graphical language.</li> <li>4. To help and guide the students to learn how technical drawings can be drawn in different methods.</li> <li>5. To acquire some different skills such as the ability to read and prepare engineering drawings, the ability to make free-hand sketching of objects, the power to imagine, analyze, and communicate, and the capacity to understand other subjects.</li> <li>6. To acquire adequate skills in measuring/scaling dimension accurately, and the method of placing dimensions.</li> <li>7. To acquire basic analysis skills in orthographic/section/isometric drawing</li> <li>8. To know the proper drawing conventions/symbols to describe the engineering drawings.</li> </ol> |
| <p><b>Module Learning Outcomes</b><br/>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>1. Get information about the important tools for engineering drawing. This will give student basic knowledge of technical drawings professions and means of communications to others.</li> <li>2. Knowing the types of lines and their applications in technical drawings.</li> <li>3. Learning the steps to construct different geometric figures like lines, arcs, polygon, ellipse etc. which is essential for engineer.</li> <li>4. Comprehend general projection theory, with emphasis on orthographic projection to represent three-dimensional objects in two-dimensional views.</li> <li>5. Develop student's imagination and ability to represent the shape size and specifications of physical objects.</li> <li>6. Learning how to draw sectional views.</li> <li>7. Knowing how to place dimensions on engineering drawings.</li> <li>8. Equipped with the skill that enables the students to convert orthographic projection into isometric projection.</li> </ol>                                 |
| <p><b>Indicative Contents</b><br/>المحتويات الإرشادية</p>                | <p>Introduction to Engineering Drawing, Drawing Tools, Pencils, Drawing Sheets, Title Block of a Sheet, Types of Lines and their Uses. (10 hrs)</p> <p>Exercises in the Use of Instruments: Straight lines (Solid, Dashed and Center Lines), Circles and Tangents. (10 hrs)</p> <p>Graphic Geometry: Bisections, Parallels, Divisions, Angles, Geometric Shapes Tangents (Straight and Curved Lines), Ellipse. (30 hrs)</p> <p>Orthographic Projection: Theory, Orthographic Views, Representation of</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Lines, Hidden Features, Center Lines. Precedence of Lines, Exercises in Projection. (30 hrs)</p> <p>Sectional Views: Definition, Classification, Full and Half Sections, Exercises in Sectional Views. (20 hrs)</p> <p>Dimensioning Practices: Introduction, Terminology and Conventions, Exercises in Dimensioning. (10 hrs)</p> <p>Introduction to Types of Pictorial Drawing: Pictorial Methods Classified, Isometric. (10 hrs)</p> <p>Isometric Drawing: Perspective Drawing, Sketching, Layout of Circles, Exercises in Isometric Drawings. (30 hrs)</p> |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, lectures and by considering a variety of assignments that are interesting to the students.</p> |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطلاب محسوب لـ 15 اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 7.7 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | 250 |                                                                           |     |

| Module Evaluation<br>تقييم المادة الدراسية |                 |             |                  |                                     |                           |
|--------------------------------------------|-----------------|-------------|------------------|-------------------------------------|---------------------------|
|                                            |                 | Time/Number | Weight (Marks)   | Week Due                            | Relevant Learning Outcome |
| Formative assessment                       | Quizzes         | 2           | 10% (10)         | 5,10                                | 1,2,3,4,5,6               |
|                                            | Assignments     | 12          | 15% (15)         | 2,3,4,5,6,7,9,10,11,12,13,14        | 1,2,3,4,5,6,7,8           |
|                                            | Projects / Lab. | 15          | 15% (15)         | 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15 | 1,2,3,4,5,6,7,8           |
|                                            | Report          |             |                  |                                     |                           |
| Summative assessment                       | Midterm Exam    | 2 hr        | 10% (10)         | 8                                   | 1,2,3,4,5                 |
|                                            | Final Exam      | 2hr         | 50% (50)         | 16                                  | All                       |
| Total assessment                           |                 |             | 100% (100 Marks) |                                     |                           |

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري |                                                                            |
|------------------------------------------------------------|----------------------------------------------------------------------------|
|                                                            | Material Covered                                                           |
| Week 1                                                     | Introduction to engineering drawing and graphic instruments and their uses |
| Week 2                                                     | Exercises in the use of instruments                                        |
| Week 3                                                     | Graphic geometry I                                                         |
| Week 4                                                     | Graphic geometry II                                                        |
| Week 5                                                     | Graphic geometry III                                                       |
| Week 6                                                     | Orthographic Projection I                                                  |
| Week 7                                                     | Orthographic Projection II                                                 |
| Week 8                                                     | Orthographic Projection III                                                |
| Week 9                                                     | Sectional Views I                                                          |
| Week 10                                                    | Sectional Views II                                                         |
| Week 11                                                    | Dimensioning Practices (introduction, terminology and conventions)         |
| Week 12                                                    | Introduction to types of Pictorial Drawing                                 |
| Week 13                                                    | Isometric Drawing I                                                        |
| Week 14                                                    | Isometric Drawing II                                                       |
| Week 15                                                    | Isometric Drawing III                                                      |
| Week 16                                                    | Preparatory week before the final Exam                                     |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|        | Material Covered |
|--------|------------------|
| Week 1 |                  |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                                                                                                                | Available in the Library? |
|-------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------|
| Required Texts    | الرسم الهندسي<br>المؤلف: عبدالرسول الخفاف بغداد –<br>1990                                                           | Yes                       |
| Recommended Texts | The Fundamentals of Engineering Drawing & Graphic Technology, Fifth Edition<br>Thomas E. French & Charles J. Vierck | No                        |
| Websites          |                                                                                                                     |                           |

## Grading Scheme

مخطط الدرجات

| Group                       | Grade            | التقدير             | Marks (%) | Definition                            |
|-----------------------------|------------------|---------------------|-----------|---------------------------------------|
| Success Group<br>(50 - 100) | A - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                             | B - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                             | C - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                             | D - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                             | E - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)      | FX – Fail        | راسب (فقد 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 Information                 |                                |                               |                                                                                                                                                                                                                                          |
|------------------------------------|--------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                                |                               |                                                                                                                                                                                                                                          |
| Module Title                       | <b>Engineering Mechanics 1</b> |                               | Module Delivery                                                                                                                                                                                                                          |
| Module Type                        | Core                           |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>CE113</b>                   |                               |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 8                              |                               |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | <b>180</b>                     |                               |                                                                                                                                                                                                                                          |
| Module Level                       | 1                              | Semester of Delivery          | 1,2                                                                                                                                                                                                                                      |
| Administering Department           | Type Dept. Code                | College                       | Type College Code                                                                                                                                                                                                                        |
| Module Leader                      | e-mail                         |                               |                                                                                                                                                                                                                                          |
| Module Leader's Acad. Title        |                                | Module Leader's Qualification |                                                                                                                                                                                                                                          |
| Module Tutor                       | Name (if available)            | e-mail                        | E-mail                                                                                                                                                                                                                                   |
| Peer Reviewer Name                 |                                | e-mail                        |                                                                                                                                                                                                                                          |
| Scientific Committee Approval Date | 01/09/2025                     | Version Number                | 1.0                                                                                                                                                                                                                                      |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                        |
| Module Aims<br>أهداف المادة الدراسية                     | The study of Engineering Mechanics aims to enable students to understand the basic principles of force analysis and equilibrium, and apply them in the analysis and design of bridges and buildings to ensure safety and sustainability. The course also teaches scientific engineering methods for dealing with friction, the centroid of stationary bodies, and determining their moment of inertia. |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | Apply knowledge of basic sciences, particularly mathematics and physics, to identify, formulate, and solve civil engineering problems, including understanding friction, methods of deriving motion, determining the centroid of regular and irregular shapes, and calculating the moment of inertia for regular and irregular shapes to assist in civil engineering analysis and design.     |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | The objectives of CE113 (Engineering Mechanics) are to learn the fundamental principles of mechanics and develop problem-solving skills by applying these principles to basic engineering problems. Specific topics covered include: friction and its effects on bodies, determining the centroid for regular and irregular shapes, and calculating the moment of inertia for various shapes. |

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                   |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | This unit is taught using a strategy that encourages students to participate in discussions, solve exercises, and simultaneously refine and expand their critical thinking skills. This will be achieved through lectures, interactive lessons, and consideration of small projects involving activities of interest to students. |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

#### الحمل الدراسي للطلاب محسوب لـ 15 اسبوعا

|                                                                                |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | 250 |                                                                           |     |

### Module Evaluation

#### تقييم المادة الدراسية

|                             |                        | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|-----------------------------|------------------------|-------------|------------------|----------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>         | 2           | 10% (10)         |          |                           |
|                             | <b>Assignments</b>     | 2           | 10% (10)         |          |                           |
|                             | <b>Projects / Lab.</b> | 1           | 10% (10)         |          |                           |
|                             | <b>Report</b>          | 1           | 10% (10)         |          |                           |
| <b>Summative assessment</b> | <b>Midterm Exam</b>    | 2 hr        | 10% (10)         |          |                           |
|                             | <b>Final Exam</b>      | 2hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>     |                        |             | 100% (100 Marks) |          |                           |

## Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

|                | Material Covered                                                                                                                                                                                                                                                      |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 1</b>  | Introduction: Definitions, International System of Units, Newton's laws of motion and Force Systems                                                                                                                                                                   |
| <b>Week 2</b>  | Resultant Of Forces System: System of Forces, Composition and Resolution of Forces, Resolution and Composition of Two Concurrent, Coplanar forces, Resolution and Composition of three or more Concurrent, Coplanar forces, Equivalent couple, Force – couple system. |
| <b>Week 3</b>  | Equilibrium: General, Free Body diagram (F.B.D), Modeling the Action of Forces in 2D Analysis, Two- and Three-Force Member, Equilibrium conditions                                                                                                                    |
| <b>Week 4</b>  | Friction: Theory of Dry Friction, The static and kinetic friction forces, Coefficients of Friction, Angles of Friction, Problems Involving Dry Friction, Procedure for Analysis,                                                                                      |
| <b>Week 5</b>  | Trusses; method of joint                                                                                                                                                                                                                                              |
| <b>Week 6</b>  | Method of section                                                                                                                                                                                                                                                     |
| <b>Week 7</b>  | Center Of Gravity And Centroid                                                                                                                                                                                                                                        |
| <b>Week 8</b>  | Moments Of Inertia                                                                                                                                                                                                                                                    |
| <b>Week 9</b>  | Dynamics: Introduction ,                                                                                                                                                                                                                                              |
| <b>Week 10</b> | Dynamics: Introduction                                                                                                                                                                                                                                                |
| <b>Week 11</b> | Rectilinear Kinematics                                                                                                                                                                                                                                                |
| <b>Week 12</b> | Continuous Motion,                                                                                                                                                                                                                                                    |
| <b>Week 13</b> | Coplanar Curvilinear Motion of a Particle Using Rectangular Components                                                                                                                                                                                                |
| <b>Week 14</b> | Motion of Projectiles                                                                                                                                                                                                                                                 |
| <b>Week 15</b> | Motion of Projectiles                                                                                                                                                                                                                                                 |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                                                                                                                                                                                         |

## Learning and Teaching Resources

مصادر التعلم والتدريس

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

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Required Texts</b>    | <ul style="list-style-type: none"> <li>• Vector Mechanics for Engineers, Ferdinand P. Beer Statics and Dynamics</li> <li>• Engineering Mechanics: by R. C. HIBBELER</li> <li>• Engineering Mechanics: Statics and Dynamics; by Archie Higdon and William B. Stiles.</li> <li>• Theory and Problems of Engineering Mechanics: Statics and Dynamics; by Mclean and Nelson.</li> <li>• Engineering Mechanics : Dynamics; 5th Edition by R. C. Hibbeler.</li> </ul> | Yes |
| <b>Recommended Texts</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | No  |
| <b>Websites</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |

| <b>Grading Scheme</b><br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                |                         |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade                   | التقدير             | Marks (%) | Definition                            |
| <b>Success Group<br/>(50 - 100)</b>                                                                                                                                                                                                                                                                                                                                                  | <b>A</b> - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>B</b> - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>C</b> - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>D</b> - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>E</b> - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| <b>Fail Group<br/>(0 – 49)</b>                                                                                                                                                                                                                                                                                                                                                       | <b>FX</b> – Fail        | راسب (فقد المعالجة) | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>F</b> – Fail         | راسب                | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                         |                     |           |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                         |                     |           |                                       |

| Module Information                 |                                |                               |                                                                                                                                                                                                                                          |
|------------------------------------|--------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                                |                               |                                                                                                                                                                                                                                          |
| Module Title                       | <b>Engineering Mechanics 2</b> |                               | Module Delivery                                                                                                                                                                                                                          |
| Module Type                        | Core                           |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>CE113</b>                   |                               |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 8                              |                               |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | <b>180</b>                     |                               |                                                                                                                                                                                                                                          |
| Module Level                       | 1                              | Semester of Delivery          | 1,2                                                                                                                                                                                                                                      |
| Administering Department           | Type Dept. Code                | College                       | Type College Code                                                                                                                                                                                                                        |
| Module Leader                      |                                | e-mail                        |                                                                                                                                                                                                                                          |
| Module Leader's Acad. Title        |                                | Module Leader's Qualification |                                                                                                                                                                                                                                          |
| Module Tutor                       | Name (if available)            | e-mail                        | E-mail                                                                                                                                                                                                                                   |
| Peer Reviewer Name                 |                                | e-mail                        |                                                                                                                                                                                                                                          |
| Scientific Committee Approval Date | 01/09/2025                     | Version Number                | 1.0                                                                                                                                                                                                                                      |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                        |
| Module Aims<br>أهداف المادة الدراسية                     | The study of Engineering Mechanics aims to enable students to understand the basic principles of force analysis and equilibrium, and apply them in the analysis and design of bridges and buildings to ensure safety and sustainability. The course also teaches scientific engineering methods for dealing with friction, the centroid of stationary bodies, and determining their moment of inertia. |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | Apply knowledge of basic sciences, particularly mathematics and physics, to identify, formulate, and solve civil engineering problems, including understanding friction, methods of deriving motion, determining the centroid of regular and irregular shapes, and calculating the moment of inertia for regular and irregular shapes to assist in civil engineering analysis and design.     |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | The objectives of CE113 (Engineering Mechanics) are to learn the fundamental principles of mechanics and develop problem-solving skills by applying these principles to basic engineering problems. Specific topics covered include: friction and its effects on bodies, determining the centroid for regular and irregular shapes, and calculating the moment of inertia for various shapes. |

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                   |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | This unit is taught using a strategy that encourages students to participate in discussions, solve exercises, and simultaneously refine and expand their critical thinking skills. This will be achieved through lectures, interactive lessons, and consideration of small projects involving activities of interest to students. |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

#### الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

|                                                                                |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

### Module Evaluation

#### تقييم المادة الدراسية

|                             |                        | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|-----------------------------|------------------------|-------------|------------------|----------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>         | 2           | 10% (10)         |          |                           |
|                             | <b>Assignments</b>     | 2           | 10% (10)         |          |                           |
|                             | <b>Projects / Lab.</b> | 1           | 10% (10)         |          |                           |
|                             | <b>Report</b>          | 1           | 10% (10)         |          |                           |
| <b>Summative assessment</b> | <b>Midterm Exam</b>    | 2 hr        | 10% (10)         |          |                           |
|                             | <b>Final Exam</b>      | 2hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>     |                        |             | 100% (100 Marks) |          |                           |

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

|         | Material Covered                       |
|---------|----------------------------------------|
| Week 1  | Friction                               |
| Week 2  | Friction                               |
| Week 3  | Friction                               |
| Week 4  | Friction                               |
| Week 5  | Friction                               |
| Week 6  | Friction                               |
| Week 7  | Centroid                               |
| Week 8  | Centroid                               |
| Week 9  | Centroid                               |
| Week 10 | Centroid                               |
| Week 11 | Centroid                               |
| Week 12 | Moment of Inertia                      |
| Week 13 | Moment of Inertia                      |
| Week 14 | Moment of Inertia                      |
| Week 15 | Moment of Inertia                      |
| Week 16 | Preparatory week before the final Exam |

### Learning and Teaching Resources

مصادر التعلم والتدريس

|                | Text                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Available in the Library? |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Required Texts | <ul style="list-style-type: none"> <li>Vector Mechanics for Engineers, Ferdinand P. Beer Statics and Dynamics</li> <li>Engineering Mechanics: by R. C. HIBBELER</li> <li>Engineering Mechanics: Statics and Dynamics; by Archie Higdon and William B. Stiles.</li> <li>Theory and Problems of Engineering Mechanics: Statics and Dynamics; by Mclean and Nelson.</li> <li>Engineering Mechanics : Dynamics; 5th Edition by R. C. Hibbeler.</li> </ul> | Yes                       |

|                   |  |    |
|-------------------|--|----|
| Recommended Texts |  | No |
| Websites          |  |    |

| Grading Scheme<br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                       |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                          | A - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | B - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | C - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | D - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | E - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                               | FX – Fail        | راسب (فقد المعالجة) | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | F – Fail         | راسب                | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                  |                     |           |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                  |                     |           |                                       |

| Module Information                 |                 |                      |                                                                                                                                                                                                                                          |        |
|------------------------------------|-----------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| معلومات المادة الدراسية            |                 |                      |                                                                                                                                                                                                                                          |        |
| Module Title                       | Mathematics 1   |                      | Module Delivery                                                                                                                                                                                                                          |        |
| Module Type                        | Basic           |                      | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |        |
| Module Code                        | E112            |                      |                                                                                                                                                                                                                                          |        |
| ECTS Credits                       | 8               |                      |                                                                                                                                                                                                                                          |        |
| SWL (hr/sem)                       | 120             |                      |                                                                                                                                                                                                                                          |        |
| Module Level                       | 1               | Semester of Delivery |                                                                                                                                                                                                                                          | 1,2    |
| Administering Department           | Type Dept. Code | College              | Type College Code                                                                                                                                                                                                                        |        |
| Module Leader                      |                 |                      | e-mail                                                                                                                                                                                                                                   |        |
| Module Leader's Acad. Title        |                 |                      | Module Leader's Qualification                                                                                                                                                                                                            |        |
| Module Tutor                       |                 |                      | e-mail                                                                                                                                                                                                                                   | E-mail |
| Peer Reviewer Name                 | Name            | e-mail               | E-mail                                                                                                                                                                                                                                   |        |
| Scientific Committee Approval Date | 01/09/2025      | Version Number       | 1.0                                                                                                                                                                                                                                      |        |

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

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                            | <ul style="list-style-type: none"> <li>• Good understanding of General Mathematics.</li> <li>• To give information about Integrations and derivations and how they are used in the physics field.</li> <li>• Helping students to connect mathematics with physics.</li> <li>• solving mathematical examples in their physics modules.</li> <li>• better understanding of integration and derivations and their importance of them in physics.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية       | <p>After successful completion of the module, students should be able to:</p> <ul style="list-style-type: none"> <li>• Work with functions represented in various ways: graphical, numerical, analytical, or verbal. They should understand the connections among these representations. The functions include linear, polynomial, absolute value, rational, exponential, logarithmic, trigonometric, inverse trigonometric, hyperbolic, inverse hyperbolic, and piecewise defined functions.</li> <li>• Define and apply the concepts of limits and continuity to the mentioned functions and study them graphically and analytically.</li> <li>• Understand the meaning of the derivative in terms of a rate of change and local linear approximation, and should be able to use derivatives to solve a variety of problems.</li> <li>• Understand the meaning of the definite integral both as a limit of Riemann sums as the net accumulation of change and should be able to use integrals to solve a variety of problems.</li> <li>• Understand the relationship between the derivative and the definite integral as expressed in both parts of the Fundamental Theorem of Calculus.</li> <li>• Use various integration techniques to obtain anti-derivatives without an integral table or calculator.</li> </ul> |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Strategies</b>                                                      | <ul style="list-style-type: none"> <li>• Different forms of teaching will be used to come across with objectives of the course. PowerPoint presentations for the head titles, definitions, graphs, and many useful illustrations with a summary at the end of each chapter will be presented and discussed.</li> <li>• The PowerPoint contains information about new topics and unsolved examples, and then the whiteboard will be used to solve them and to let students to see the solutions.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

| Module Evaluation               |                                                                                                                                                                                                                                                                                           |             |                  |          |                           |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية           |                                                                                                                                                                                                                                                                                           |             |                  |          |                           |
|                                 |                                                                                                                                                                                                                                                                                           | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment            | Quizzes                                                                                                                                                                                                                                                                                   | 2           | 10% (10)         |          |                           |
|                                 | Assignments                                                                                                                                                                                                                                                                               | 2           | 10% (10)         |          |                           |
|                                 | Projects / Lab.                                                                                                                                                                                                                                                                           | 1           | 10% (10)         |          |                           |
|                                 | Report                                                                                                                                                                                                                                                                                    | 1           | 10% (10)         |          |                           |
| Summative assessment            | Midterm Exam                                                                                                                                                                                                                                                                              | 2hr         | 10% (10)         |          |                           |
|                                 | Final Exam                                                                                                                                                                                                                                                                                | 2hr         | 50% (50)         | 16       | All                       |
| Total assessment                |                                                                                                                                                                                                                                                                                           |             | 100% (100 Marks) |          |                           |
| Delivery Plan (Weekly Syllabus) |                                                                                                                                                                                                                                                                                           |             |                  |          |                           |
| المناهج الاسبوعي النظري         |                                                                                                                                                                                                                                                                                           |             |                  |          |                           |
|                                 | Material Covered                                                                                                                                                                                                                                                                          |             |                  |          |                           |
| Week 1                          | <b>Algebraic Preliminaries</b><br>Numbers, Sets, Inequalities & Absolute value.                                                                                                                                                                                                           |             |                  |          |                           |
| Week 2                          | <b>Functions</b><br>Domain, Range, graphs, Symmetry, Asymptotes.                                                                                                                                                                                                                          |             |                  |          |                           |
| Week 3                          | <b>Limits</b><br>Definition of Limit, Theorems, Continuity, One-Sided Limits, Limits at Infinity, L Hopital's rule.                                                                                                                                                                       |             |                  |          |                           |
| Week 4                          | <b>Derivatives</b><br>Definition, Power and Sum Rules, Product and Quotient Rules, Chain rule, High-Order derivatives, Implicit differentiation.                                                                                                                                          |             |                  |          |                           |
| Week 5                          | <b>Applications of Derivative</b><br>Maximum and minimum, mean value theorem, Increasing and Decreasing Functions, Concavity and Points of inflection, Second Derivative Test.                                                                                                            |             |                  |          |                           |
| Week 6                          | <b>Definite Integration</b><br>Definition, Integral Theorems, Length of a Curve, Areas, Volume of Solids, Surface Area, Indefinite Integrals.                                                                                                                                             |             |                  |          |                           |
| Week 7                          | <b>Transcendental Functions</b><br>Trigonometric Functions, Graphs, Derivatives of trigonometric functions, Inverse trigonometric functions, Graphs, Derivatives of Inverse trigonometric functions, Natural Logarithm Functions, Exponential Functions, Functions $a^u$ and $\log_a u$ . |             |                  |          |                           |

|                |                                                                                                                                                                                           |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 8</b>  | <b>Complex Number</b><br>Invented number systems, The Argand diagram. Addition, Subtraction, product, Qutient, Power and Roots. Demoivers theorem.                                        |
| <b>Week 9</b>  | <b>Hyperbolic Functions</b><br>Definition, Derivatives, Integrals, Inverse Hyperbolic Functions.                                                                                          |
| <b>Week 10</b> | <b>Plane Analytic Geometry</b><br>Circle, Parabola, Ellipse, Hyperbola                                                                                                                    |
| <b>Week 11</b> | <b>Volume of Revolution</b><br>Disk Method & Washer Method                                                                                                                                |
| <b>Week 12</b> | <b>Volume of Revolution</b><br>Volumes by Cylindrical Shells & solid with known cross sections                                                                                            |
| <b>Week 13</b> | <b>Methods of Integrations</b><br>Integration by substitution, Trigonometric Integrals & Quadratic Functions                                                                              |
| <b>Week 14</b> | <b>Methods of Integrations</b><br>Integration by Parts, Integration by partial fractions, Integration of Rational Functions, improper integrals.                                          |
| <b>Week 15</b> | <b>Matrices and Determinates</b><br>Definition, Properties of Matrices, Operations on Matrices, Determinants, Matrix Inverse, Solution of Linear Simultaneous Equations (Gramer's Rule ). |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                                                                                                             |

| <b>Learning and Teaching Resources</b><br><b>مصادر التعلم والتدريس</b> |                                                                                                                                                                                                                   |                                  |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                                                        | <b>Text</b>                                                                                                                                                                                                       | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                                  | 1. Calculus with Analytical Geometry, Fourth Edition, By Robert Ellis and Denny Gulick, 1990.<br>2. Calculus, Fifth Edition, By Stanley I. Cross may1992.<br>3. Calculus, International Edition, By Thomas, 2005. | Yes                              |
| <b>Recommended Texts</b>                                               | 1. Calculus, 11th Edition, By Thomas, 2013.<br>2. Understanding Basic Calculus, by S.K. Chung, 2007                                                                                                               | Yes                              |
| <b>Websites</b>                                                        |                                                                                                                                                                                                                   |                                  |

| Module Information                 |                      |                      |                                                                                                                                                                                                                               |        |
|------------------------------------|----------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| معلومات المادة الدراسية            |                      |                      |                                                                                                                                                                                                                               |        |
| Module Title                       | <b>Mathematics 2</b> |                      | Module Delivery                                                                                                                                                                                                               |        |
| Module Type                        | Basic                |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |        |
| Module Code                        | <b>E112</b>          |                      |                                                                                                                                                                                                                               |        |
| ECTS Credits                       | 8                    |                      |                                                                                                                                                                                                                               |        |
| SWL (hr/sem)                       | 120                  |                      |                                                                                                                                                                                                                               |        |
| Module Level                       | 1                    | Semester of Delivery |                                                                                                                                                                                                                               | 1,2    |
| Administering Department           | Type Dept. Code      | College              | Type College Code                                                                                                                                                                                                             |        |
| Module Leader                      |                      |                      | e-mail                                                                                                                                                                                                                        |        |
| Module Leader's Acad. Title        |                      |                      | Module Leader's Qualification                                                                                                                                                                                                 |        |
| Module Tutor                       |                      |                      | e-mail                                                                                                                                                                                                                        | E-mail |
| Peer Reviewer Name                 | Name                 | e-mail               | E-mail                                                                                                                                                                                                                        |        |
| Scientific Committee Approval Date | 01/09/2025           | Version Number       | 1.0                                                                                                                                                                                                                           |        |

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

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                            | <ul style="list-style-type: none"> <li>• Good understanding of General Mathematics.</li> <li>• To give information about Integrations and derivations and how they are used in the physics field.</li> <li>• Helping students to connect mathematics with physics.</li> <li>• solving mathematical examples in their physics modules.</li> <li>• better understanding of integration and derivations and their importance of them in physics.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية       | <p>After successful completion of the module, students should be able to:</p> <ul style="list-style-type: none"> <li>• Work with functions represented in various ways: graphical, numerical, analytical, or verbal. They should understand the connections among these representations. The functions include linear, polynomial, absolute value, rational, exponential, logarithmic, trigonometric, inverse trigonometric, hyperbolic, inverse hyperbolic, and piecewise defined functions.</li> <li>• Define and apply the concepts of limits and continuity to the mentioned functions and study them graphically and analytically.</li> <li>• Understand the meaning of the derivative in terms of a rate of change and local linear approximation, and should be able to use derivatives to solve a variety of problems.</li> <li>• Understand the meaning of the definite integral both as a limit of Riemann sums as the net accumulation of change and should be able to use integrals to solve a variety of problems.</li> <li>• Understand the relationship between the derivative and the definite integral as expressed in both parts of the Fundamental Theorem of Calculus.</li> <li>• Use various integration techniques to obtain anti-derivatives without an integral table or calculator.</li> </ul> |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Strategies</b>                                                      | <ul style="list-style-type: none"> <li>• Different forms of teaching will be used to come across with objectives of the course. PowerPoint presentations for the head titles, definitions, graphs, and many useful illustrations with a summary at the end of each chapter will be presented and discussed.</li> <li>• The PowerPoint contains information about new topics and unsolved examples, and then the whiteboard will be used to solve them and to let students to see the solutions.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

| Module Evaluation               |                                                                                         |             |                  |          |                           |
|---------------------------------|-----------------------------------------------------------------------------------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية           |                                                                                         |             |                  |          |                           |
|                                 |                                                                                         | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment            | Quizzes                                                                                 | 2           | 10% (10)         |          |                           |
|                                 | Assignments                                                                             | 2           | 10% (10)         |          |                           |
|                                 | Projects / Lab.                                                                         | 1           | 10% (10)         |          |                           |
|                                 | Report                                                                                  | 1           | 10% (10)         |          |                           |
| Summative assessment            | Midterm Exam                                                                            | 2hr         | 10% (10)         |          |                           |
|                                 | Final Exam                                                                              | 2hr         | 50% (50)         | 16       | All                       |
| Total assessment                |                                                                                         |             | 100% (100 Marks) |          |                           |
| Delivery Plan (Weekly Syllabus) |                                                                                         |             |                  |          |                           |
| المناهج الأسبوعي النظري         |                                                                                         |             |                  |          |                           |
|                                 | Material Covered                                                                        |             |                  |          |                           |
| Week 1                          | Complex numbersComplex number systems, Argand diagram.                                  |             |                  |          |                           |
| Week 2                          | Addition, subtraction, multiplication, division, powers, and roots, De Moivre's theorem |             |                  |          |                           |
| Week 3                          | Hyperbolic functions: definition, derivatives                                           |             |                  |          |                           |
| Week 4                          | Hyperbolic functions: Integrals, inverse hyperbolic functions.                          |             |                  |          |                           |
| Week 5                          | Plane Analytical Geometry: Circle, Parabola                                             |             |                  |          |                           |
| Week 6                          | Plane Analytical Geometry: Ellipse, Hyperbola                                           |             |                  |          |                           |
| Week 7                          | Magnitude of the rotation result: Disc method                                           |             |                  |          |                           |

|                |                                                                                                                          |
|----------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Week 8</b>  | Volume of the rotation: The method of cylindrical shells                                                                 |
| <b>Week 9</b>  | Surface area resulting from rotation: The method of cylindrical shells                                                   |
| <b>Week 10</b> | Methods of Integration: Integration by Substitution                                                                      |
| <b>Week 11</b> | Methods of Integration: Trigonometric Integrals and Quadratic Functions                                                  |
| <b>Week 12</b> | Methods of integration: integration by parts, integration by partial fractions                                           |
| <b>Week 13</b> | Integration methods: integration of rational functions, improper integrals                                               |
| <b>Week 14</b> | Matrices and Determinants: Definition, Properties of Matrices, Operations on Matrices                                    |
| <b>Week 15</b> | Matrices and determinants: determinants, the inverse of a matrix, solving simultaneous linear equations (Cramer's rule). |
| <b>Week 16</b> | Preparatory week before the final Exam                                                                                   |

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                                                                                                                                                                                                   |                                  |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                                                 | <b>Text</b>                                                                                                                                                                                                       | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                           | 1. Calculus with Analytical Geometry, Fourth Edition, By Robert Ellis and Denny Gulick, 1990.<br>2. Calculus, Fifth Edition, By Stanley I. Cross may1992.<br>3. Calculus, International Edition, By Thomas, 2005. | Yes                              |
| <b>Recommended Texts</b>                                        | 1. Calculus, 11th Edition, By Thomas, 2013.<br>2. Understanding Basic Calculus, by S.K. Chung, 2007                                                                                                               | Yes                              |
| <b>Websites</b>                                                 |                                                                                                                                                                                                                   |                                  |

| Module Information                 |                          |                               |                                                                                                                                               |
|------------------------------------|--------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                          |                               |                                                                                                                                               |
| Module Title                       | <b>Building Material</b> |                               | Module Delivery                                                                                                                               |
| Module Type                        | Core                     |                               | ✓ Theory<br>✓ Lecture<br>✓ Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>CE124</b>             |                               |                                                                                                                                               |
| ECTS Credits                       | 6                        |                               |                                                                                                                                               |
| SWL (hr/sem)                       | <b>90</b>                |                               |                                                                                                                                               |
| Module Level                       | 1                        | Semester of Delivery          | 1                                                                                                                                             |
| Administering Department           | Type Dept. Code          | College                       | Type College Code                                                                                                                             |
| Module Leader                      | e-mail                   |                               |                                                                                                                                               |
| Module Leader's Acad. Title        |                          | Module Leader's Qualification |                                                                                                                                               |
| Module Tutor                       | e-mail                   |                               | E-mail                                                                                                                                        |
| Peer Reviewer Name                 | Name                     | e-mail                        | E-mail                                                                                                                                        |
| Scientific Committee Approval Date | 01/09/2025               | Version Number                | 1.0                                                                                                                                           |

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

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

|                                                                                |                                                                                                                                                                                                                                                                                                                                                                      |                                                                           |      |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                                    | 1- Definition of building materials and the importance of studying them.<br>2- Studying models of building materials.<br>3- How to deal with building materials and benefit from them.<br>4- History of building materials and ways to develop them.<br>5- Studying all the properties related to building materials, including physical, chemical, mechanical, etc. |                                                                           |      |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية               | 1- Knowing the building materials used previously and at the present time.<br>2- Methods of preparing old and modern building materials.<br>3- The different properties of building materials.<br>4- Laws and equations related to each material.<br>5- Knowing the factors affecting these materials as well as ways to develop them.                               |                                                                           |      |
| <b>Indicative Contents</b><br>المحتويات الارشادية                              |                                                                                                                                                                                                                                                                                                                                                                      |                                                                           |      |
| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم         |                                                                                                                                                                                                                                                                                                                                                                      |                                                                           |      |
| <b>Strategies</b>                                                              | The strategy used in this curriculum is to direct the student to study building materials and think about ways to develop them and understand their properties and everything related to them through studying them theoretically and conducting experiments for each material in the laboratory.                                                                    |                                                                           |      |
| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطلاب محسوب لـ 15 اسبوعا       |                                                                                                                                                                                                                                                                                                                                                                      |                                                                           |      |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       | 114                                                                                                                                                                                                                                                                                                                                                                  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       | 8    |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 86                                                                                                                                                                                                                                                                                                                                                                   | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 5.73 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | 200                                                                                                                                                                                                                                                                                                                                                                  |                                                                           |      |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                 |             |                |          |                           |
|---------------------------------------------------|-----------------|-------------|----------------|----------|---------------------------|
|                                                   |                 | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
| Formative assessment                              | Quizzes         | 2           | 10% (10)       |          |                           |
|                                                   | Assignments     | 2           | 10% (10)       |          |                           |
|                                                   | Projects / Lab. | 1           | 10% (10)       |          |                           |
|                                                   | Report          | 1           | 10% (10)       |          |                           |
| Summative                                         | Midterm Exam    | 2 hr        | 10% (10)       |          |                           |

|                  |            |     |                  |    |     |
|------------------|------------|-----|------------------|----|-----|
| assessment       | Final Exam | 2hr | 50% (50)         | 16 | All |
| Total assessment |            |     | 100% (100 Marks) |    |     |

| Delivery Plan (Weekly Syllabus) |                                                                                     |
|---------------------------------|-------------------------------------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                                                     |
|                                 | Material Covered                                                                    |
| Week 1                          | Introduction to the science of building materials.                                  |
| Week 2                          | General properties of building materials.                                           |
| Week 3                          | General properties of building materials.                                           |
| Week 4                          | Mechanical properties of engineering materials.                                     |
| Week 5                          | Stress-strain curves for some materials.                                            |
| Week 6                          | Modulus of elasticity for some engineering materials.                               |
| Week 7                          | Creeping and the factors affecting it and its curve.                                |
| Week 8                          | Fatigue and finding the limit of continuity.                                        |
| Week 9                          | Bricks, their types, methods of classification and manufacture.                     |
| Week 10                         | Bricks, their types, methods of classification and manufacture.                     |
| Week 11                         | Wood, its composition and methods of preservation.                                  |
| Week 12                         | Ferrous materials, their types, methods of preparation, and factors affecting them. |
| Week 13                         | Tiles, its types and specifications.                                                |
| Week 14                         | Types of plaster and the most important gypsum products.                            |
| Week 15                         | Binding materials and their uses locally and their types.                           |
| Week 16                         | Preparatory week before the final Exam                                              |

| Learning and Teaching Resources |                                                                                      |                           |
|---------------------------------|--------------------------------------------------------------------------------------|---------------------------|
| مصادر التعلم والتدريس           |                                                                                      |                           |
|                                 | Text                                                                                 | Available in the Library? |
| Required Texts                  | Building materials science,                                                          | Yes                       |
| Recommended Texts               | Natural building materials technology, For the author, Dr. Ahmed Ibrahim Al-Attiyah. | No                        |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

|        | Material Covered |
|--------|------------------|
| Week 1 | Introduction     |
| Week 2 | Brick test       |
| Week 3 | Iron test.       |
| Week 4 | Tiles test.      |
| Week 5 | Plaster test.    |
| Week 6 | Wood test.       |
| Week 7 | Final Exam       |

## Grading Scheme

مخطط الدرجات

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

| Module Information                 |                     |                               |                                                                                                                                                                                                                                          |
|------------------------------------|---------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                     |                               |                                                                                                                                                                                                                                          |
| Module Title                       | Engineering Geology |                               | Module Delivery                                                                                                                                                                                                                          |
| Module Type                        | Basic               |                               | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | CE114               |                               |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 6                   |                               |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 75                  |                               |                                                                                                                                                                                                                                          |
| Module Level                       | 1                   | Semester of Delivery          | 2                                                                                                                                                                                                                                        |
| Administering Department           | Type Dept. Code     | College                       | Type College Code                                                                                                                                                                                                                        |
| Module Leader                      |                     | e-mail                        |                                                                                                                                                                                                                                          |
| Module Leader's Acad. Title        |                     | Module Leader's Qualification |                                                                                                                                                                                                                                          |
| Module Tutor                       | None                | e-mail                        | None                                                                                                                                                                                                                                     |
| Peer Reviewer Name                 | None                | e-mail                        | None                                                                                                                                                                                                                                     |
| Scientific Committee Approval Date | 01/09/2025          | Version Number                | 1.0                                                                                                                                                                                                                                      |

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

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

|                                                                  |                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | 1. To outline the contribution of engineering geology to the civil and mining works<br>2. To explain the classical approach to solve an engineering geological problem<br>3. The extensive uses of engineering geology maps<br>4. The role and effect of engineering geology in the improvement of earth materials                               |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | The student will be trained to know the description of soil and rock masses for engineering purposes and is also expected to know the following:<br>1. Engineering geological maps and its applications.<br>2. Rock engineering properties and the geotechnical problems they cause.<br>3. The various techniques for soil and rock improvement. |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                |                                                                                                                                                                                                                                                                                                                                                  |

### Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |  |
|-------------------|--|
| <b>Strategies</b> |  |
|-------------------|--|

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

|                                                                                |     |                                                                           |      |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|------|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 86  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 6    |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 64  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4.26 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 150 |                                                                           |      |

| Module Evaluation     |                 |             |                  |            |                           |
|-----------------------|-----------------|-------------|------------------|------------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |            |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 10% (10)         | 7,12       | 5, 6, 10, and 11          |
|                       | Assignments     | 2           | 10% (10)         | 4, 14      | 1, 2, 11, and 12          |
|                       | Projects / Lab. | 1           | 10% (10)         | Continuous |                           |
|                       | Report          | 1           | 10% (10)         | 13         | 3, 4, and 11              |
| Summative assessment  | Midterm Exam    | 2 hr        | 10% (10)         | 8          | 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                          | An introduction to engineering geology                                           |
| Week 2                          | Minerals and rocks                                                               |
| Week 3                          | Physical and mechanical properties of rocks                                      |
| Week 4                          | Soil geology and properties                                                      |
| Week 5                          | Groundwater (Part 1)                                                             |
| Week 6                          | Groundwater (Part 2)                                                             |
| Week 7                          | Geology maps                                                                     |
| Week 8                          | Mid-term Exam                                                                    |
| Week 9                          | Topography maps (Part 1)                                                         |
| Week 10                         | Topography maps (Part 2)                                                         |
| Week 11                         | Soil investigations (Part 1)                                                     |
| Week 12                         | Soil investigations (Part 2)                                                     |
| Week 13                         | Geological principles for the selection of foundations (problems of foundations) |
| Week 14                         | Geological investigation of building materials and road paving                   |
| Week 15                         | Preparatory Week                                                                 |
| Week 16                         | Final Exam                                                                       |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

|        | Material Covered   |
|--------|--------------------|
| Week 1 | Introduction       |
| Week 2 | Discovery of metal |
| Week 3 | Discovery of rocks |
| Week 4 | Geology maps       |
| Week 5 | Topography maps    |
| Week 6 | Final Exam         |
| Week 7 |                    |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                                        | Available in the Library? |
|-------------------|---------------------------------------------|---------------------------|
| Required Texts    | Engineering Geology by Dr. Majeed Al-Taa'e  | Yes                       |
| Recommended Texts | ENGINEERING GEOLOGY by Sabinoy Gangopadhyay | No                        |
| Websites          | -                                           |                           |

## Grading Scheme

مخطط الدرجات

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

| Module Information                 |                                         |                               |                                                                                                                                               |  |
|------------------------------------|-----------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية            |                                         |                               |                                                                                                                                               |  |
| Module Title                       | CHEMISTRY                               |                               | Module Delivery                                                                                                                               |  |
| Module Type                        | Core                                    |                               | ✓ Theory<br>✓ Lecture<br>✓ Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Code                        | CE126                                   |                               |                                                                                                                                               |  |
| ECTS Credits                       | 3                                       |                               |                                                                                                                                               |  |
| SWL (hr/sem)                       | 45                                      |                               |                                                                                                                                               |  |
| Module Level                       | 1                                       | Semester of Delivery          | 1                                                                                                                                             |  |
| Administering Department           | Type Dept. Code                         | College                       | Type College Code                                                                                                                             |  |
| Module Leader                      | Mohammed Mustafa Mohammed Nooruldin Ars |                               | e-mail                                                                                                                                        |  |
| Module Leader's Acad. Title        | Ass. Lecturer                           | Module Leader's Qualification | M. Sc.                                                                                                                                        |  |
| Module Tutor                       |                                         | e-mail                        | E-mail                                                                                                                                        |  |
| Peer Reviewer Name                 | Name                                    | e-mail                        | E-mail                                                                                                                                        |  |
| Scientific Committee Approval Date | 01/09/2025                              | Version Number                | 1.0                                                                                                                                           |  |

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

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

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | The course aims to present the basic methods for interpreting the behaviour of various types of materials in terms of their chemical compositions. Emphasis was placed on the application of chemical principles and their relationship to civil engineering.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <ol style="list-style-type: none"> <li>1. Discuss how engineering involves chemistry</li> <li>2. Summarize Chemistry applications in Building Materials (Examples)</li> <li>3. Identify the structure of materials. The concept and structure of matter</li> <li>4. Recognize Cement chemistry. its manufacture, reaction with water and setting to form a solid used in almost all structures.</li> <li>5. Discuss how to produce cement limestone and clay and to react at high temperatures. The individual elements Ca, Si, O, Al, Fe rearrange themselves to form reactive cement. When mixed with water this cement will harden to become hydrated or hardened cement.</li> <li>6. Identify the Chemical Composition of Cement</li> <li>7. Identify burning process : chemical reactions in rotary Klin Zones</li> <li>8. Discuss the sequence of changes during setting and hardening</li> <li>9. Identify Setting and Hardening : Chemical Reactions</li> <li>10. Discuss the Classification of Cements</li> <li>11. Identify the Green cement and its different types.</li> <li>12. Recognize Corrosion of Concrete Reinforcement – Causes &amp; Remedies</li> <li>13. Discuss the Factors Influencing Corrosion of Reinforcement</li> <li>14. Discuss the Remedial Measures To Protect Reinforcement From Corrosion</li> <li>15. Recognize water chemistry for better selection of suitable sources of water for human consumption and for livestock.</li> <li>16. Discuss Water Quality Characteristics.</li> <li>17. Identify Physical Characteristics of Water</li> </ol> |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>Indicative content includes the following.</p> <p>Chemistry importance fundamental, engineering involves chemistry in the following manners, chemistry applications in building materials (examples) the life cycles of all buildings are limited, chemical influences, the structure of materials. the concept and structure of matter[4 hrs]</p> <p>Cement chemistry, Portland cement chemical component, raw materials of portlandcementandit'suse,manufacturingcement,burningprocess: view of complete setup grinding and packaging, burning process : chemical reactions in rotary klin zones, [6 hrs]</p> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Properties of cement : setting and hardening, setting and hardening : chemical reactions, classification of cement based on chemical composition, portland cement types, special types of cement, green cement, some types of green cement [7 hrs]</p> <p>Corrosion chemistry, corrosion of concrete reinforcement – causes &amp; remedies, factors influencing corrosion of reinforcement, remedial measures to protect reinforcement from corrosion . [4Hrs]</p> <p>Water chemistry. water quality characteristics, physical characteristics of water, chemical characteristics of water, inorganic minerals , major cations, major anions, carbonate equilibrium, ph and alkalinity, acidity, inorganic indicators of water quality, hardness, total dissolved solids, conductivity, sodium adsorption ratio, [6 hrs]</p> <p>Radionuclides, organic materials, natural organic matter, man-made organics, measurement of organics in water - organic carbon, organic indicators of water quality, biological oxygen demand, chemical oxygen demand, dissolved gases, solubility of gases, dissolved oxygen, microbiological characteristics, biological characteristics of water [6 hrs]</p> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Module Evaluation

تقييم المادة الدراسية

|                      |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|----------------------|-----------------|-------------|------------------|----------|---------------------------|
| Formative assessment | Quizzes         | 2           | 10% (10)         |          |                           |
|                      | Assignments     | 2           | 10% (10)         |          |                           |
|                      | Projects / Lab. | 1           | 10% (10)         |          |                           |
|                      | Report          | 1           | 10% (10)         |          |                           |
| Summative assessment | Midterm Exam    | 2hr         | 10% (10)         |          |                           |
|                      | Final Exam      | 2hr         | 50% (50)         | 16       | All                       |
| Total assessment     |                 |             | 100% (100 Marks) |          |                           |

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

|        | Material Covered                                                 |
|--------|------------------------------------------------------------------|
| Week 1 | Introduction - Chemistry importance for Engineering              |
| Week 2 | The structure of materials. the concept and structure of matter. |

|                |                                                                                                                                                                                                                     |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 3</b>  | Cement chemistry, burning process : chemical reactions in rotary klin zones.                                                                                                                                        |
| <b>Week 4</b>  | Setting and hardening : chemical reactions.                                                                                                                                                                         |
| <b>Week 5</b>  | Classification of cement based on chemical composition                                                                                                                                                              |
| <b>Week 6</b>  | Green Cement                                                                                                                                                                                                        |
| <b>Week 7</b>  | Mid-term Exam                                                                                                                                                                                                       |
| <b>Week 8</b>  | Corrosion chemistry                                                                                                                                                                                                 |
| <b>Week 9</b>  | Remedial measures to protect reinforcement from corrosion                                                                                                                                                           |
| <b>Week 10</b> | Water chemistry                                                                                                                                                                                                     |
| <b>Week 11</b> | Carbonate Equilibrium, pH and Alkalinity, Acidity,.                                                                                                                                                                 |
| <b>Week 12</b> | Inorganic indicators of water quality, hardness, total dissolved solids, conductivity, sodium adsorption ratio,                                                                                                     |
| <b>Week 13</b> | Radionuclides, organic materials, natural organic matter, man-made organics, measurement of organics in water - organic carbon.                                                                                     |
| <b>Week 14</b> | Organic indicators of water quality, biological oxygen demand, chemical oxygen demand, dissolved gases, solubility of gases, dissolved oxygen, microbiological characteristics, biological characteristics of water |
| <b>Week 15</b> | Preparatory Week                                                                                                                                                                                                    |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                                                                                                                                       |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

|               | <b>Material Covered</b>                                                |
|---------------|------------------------------------------------------------------------|
| <b>Week 1</b> | • Laboratory Safety Rules and Equipment Familiarization                |
| <b>Week 2</b> | • Measurement of Mass, Volume, and Density                             |
| <b>Week 3</b> | • Separation of Mixtures (Filtration, Evaporation, and Chromatography) |
| <b>Week 4</b> | • Determination of Melting and Boiling Points                          |
| <b>Week 5</b> | • Observation of Chemical and Physical Changes                         |
| <b>Week 6</b> | • Preparation and Standardization of Solutions                         |
| <b>Week 7</b> | • Acid-Base Titration and pH Measurement                               |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                                                                                                                   | Available in the Library? |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | Cement and Concrete Chemistry, Wieslaw Kurdowski, Springer Water Chemistry Green Science and Technology of Nature's Most Renewable Resource , S. E. Manahan, CRC press | Yes                       |
| <b>Recommended Texts</b> | Chemistry of Water, Rao, Rao Alla Appa, New Age International (P) Limited                                                                                              | No                        |
| <b>Websites</b>          | <a href="https://chem.libretexts.org">https://chem.libretexts.org</a>                                                                                                  |                           |

## Grading Scheme

مخطط الدرجات

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

| Module Information                 |                 |                               |                                                                                                                                                                                                                               |
|------------------------------------|-----------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                 |                               |                                                                                                                                                                                                                               |
| Module Title                       | English         |                               | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | Supported       |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | U111            |                               |                                                                                                                                                                                                                               |
| ECTS Credits                       | 2               |                               |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | 30              |                               |                                                                                                                                                                                                                               |
| Module Level                       | 1               | Semester of Delivery          | 2                                                                                                                                                                                                                             |
| Administering Department           | Type Dept. Code | College                       | Type College Code                                                                                                                                                                                                             |
| Module Leader                      |                 | e-mail                        |                                                                                                                                                                                                                               |
| Module Leader's Acad. Title        |                 | Module Leader's Qualification |                                                                                                                                                                                                                               |
| Module Tutor                       |                 | e-mail                        | E-mail                                                                                                                                                                                                                        |
| Peer Reviewer Name                 | Name            | e-mail                        | E-mail                                                                                                                                                                                                                        |
| Scientific Committee Approval Date | 01/09/2025      | Version Number                | 1.0                                                                                                                                                                                                                           |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                   |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                   |
| Module Aims<br>أهداف المادة الدراسية                     | Improve the students' skills of reading, speaking, and writing. Enrich the vocabulary of the student with new words related to Civil Engineering. |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <ul style="list-style-type: none"> <li>Clarify the basic concepts of the English language by defining the tools for grammar, formulating sentences, texts, and pronunciation.</li> <li>Acquisition of skills in speaking and writing research and reports.</li> <li>The ability to read, write and to gain experience in dealing with foreign companies.</li> </ul> |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                |                                                                                                                                                                                                                                                                                                                                                                     |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>Teaching and learning strategies of English include a range of whole class, group of two or three students and individual activities to examine the different abilities, skills and learning rates of each student and allow every student to participate and to achieve some degree of success.</p> <p>Some of these strategies are:</p> <ul style="list-style-type: none"> <li>Readings with a focus on improving the spelling of some complex words.</li> <li>Exercises and activities during the lecture.</li> <li>Homework assignments.</li> <li>Directing students to some websites for learning and practicing.</li> <li>Conducting seminars to explain and analyze a specific issue and find solutions to</li> </ul> |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 58  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 42  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 2.8 |
| <b>Total SWL (h/sem)</b><br>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)         |          |                           |
|                      | Assignments  | 8           | 20% (20)         |          |                           |
|                      | Seminar      | 1           | 10% (10)         |          |                           |
| Summative assessment | Midterm Exam | 2 hr        | 10% (10)         |          |                           |
|                      | Final Exam   | 2hr         | 50% (50)         | 16       | All                       |
| Total assessment     |              |             | 100% (100 Marks) |          |                           |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

|         | Material Covered                       |
|---------|----------------------------------------|
| Week 1  | Present tense                          |
| Week 2  | Past tense                             |
| Week 3  | Future tense                           |
| Week 4  | Punctuation                            |
| Week 5  | Capitalization                         |
| Week 6  | Simple sentences                       |
| Week 7  | Compound sentences                     |
| Week 8  | Prewriting techniques                  |
| Week 9  | Midterm exam                           |
| Week 10 | Connecting ideas                       |
| Week 11 | Comparison                             |
| Week 12 | Nouns                                  |
| Week 13 | Pronouns                               |
| Week 14 | The passive.                           |
| Week 15 | How to write an academic report        |
| Week 16 | Preparatory week before the final Exam |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                                                                        | Available in the Library? |
|-------------------|-----------------------------------------------------------------------------|---------------------------|
| Required Texts    | Lectures and handouts                                                       | No                        |
| Recommended Texts |                                                                             | No                        |
| Websites          | <a href="https://www.english-grammar.at">https://www.english-grammar.at</a> |                           |

## Grading Scheme

مخطط الدرجات

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

| Module Information                 |                 |                               |                                                                                                                                                                                                                                                     |
|------------------------------------|-----------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                 |                               |                                                                                                                                                                                                                                                     |
| Module Title                       | Physics         |                               | Module Delivery                                                                                                                                                                                                                                     |
| Module Type                        | Core            |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | E119            |                               |                                                                                                                                                                                                                                                     |
| ECTS Credits                       | 3               |                               |                                                                                                                                                                                                                                                     |
| SWL (hr/sem)                       | 45              |                               |                                                                                                                                                                                                                                                     |
| Module Level                       | 1               | Semester of Delivery          | 1                                                                                                                                                                                                                                                   |
| Administering Department           | Type Dept. Code | College                       | Type College Code                                                                                                                                                                                                                                   |
| Module Leader                      | e-mail          |                               |                                                                                                                                                                                                                                                     |
| Module Leader's Acad. Title        |                 | Module Leader's Qualification |                                                                                                                                                                                                                                                     |
| Module Tutor                       | e-mail          |                               | E-mail                                                                                                                                                                                                                                              |
| Peer Reviewer Name                 | Name            | e-mail                        | E-mail                                                                                                                                                                                                                                              |
| Scientific Committee Approval Date | 01/09/2025      | Version Number                | 1.0                                                                                                                                                                                                                                                 |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | The course provides general information about physics and its branches, with a focus on the branches that are relevant to the study of civil engineering, such as classical mechanics and the laws and equations of motion. All phenomena in the natural world are measured in terms of a few fundamental relationships between measurable properties of matter and energy. These relationships are called the laws of physics, and they are formulas characterized by a high degree of generality, |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | derived from a vast number of phenomena. The goal of physics can be summarized as expressing these fundamental relationships (these laws) in a mathematical form, enabling the student to use the logical rules of mathematics to apply the laws to specific cases and thus obtain quantitative results. Most physical laws are important in the field of civil engineering, which requires engineers to understand these laws to reflect them in the engineering reality related to mathematics, engineering foundations, fluid motion, hydraulic structures, and others.                                                                                                                                                                                      |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | 1- Clarifying the basic concepts of physics.<br>2- Acquiring skills in handling and understanding the laws of physics in a simplified manner.<br>3- Acquiring the essential skills as an introduction to the physical properties necessary to describe all physical measurements, called dimensions, which are length, mass, time, temperature, electric current, number of particles, and luminous intensity. And deriving other physical quantities such as force, energy, and momentum from these seven basic dimensions.<br>4- The ability to know and understand the science of physics.<br>5- The ability to think about solving any problem.<br>6- Writing scientific reports.<br>7- The ability to gain experience in dealing with physical quantities. |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                     |
|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | The course aims to provide basic information about general physics that civil engineering students need in the subjects of static and dynamic mechanics, materials resistance, and fluid mechanics. |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                        |             |                  |          |                           |
|---------------------------------------------------|------------------------|-------------|------------------|----------|---------------------------|
|                                                   |                        | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | <b>Quizzes</b>         | 2           | 10% (10)         |          |                           |
|                                                   | <b>Assignments</b>     | 2           | 10% (10)         |          |                           |
|                                                   | <b>Projects / Lab.</b> | 1           | 10% (10)         |          |                           |
|                                                   | <b>Report</b>          | 1           | 10% (10)         |          |                           |
| <b>Summative assessment</b>                       | <b>Midterm Exam</b>    | 2hr         | 10% (10)         |          |                           |
|                                                   | <b>Final Exam</b>      | 2hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>                           |                        |             | 100% (100 Marks) |          |                           |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

|         | Material Covered                       |
|---------|----------------------------------------|
| Week 1  | Introduction to physics                |
| Week 2  | units and dimensions                   |
| Week 3  | vectors                                |
| Week 4  | Statics                                |
| Week 5  | Kinematics                             |
| Week 6  | Body dynamics                          |
| Week 7  | Newton's laws of motion                |
| Week 8  | Work, energy and power                 |
| Week 9  | Momentum                               |
| Week 10 | Rotational motion                      |
| Week 11 | Harmonic motion                        |
| Week 12 | Flexibility                            |
| Week 13 | Fluids                                 |
| Week 14 | The heat                               |
| Week 15 | The sound                              |
| Week 16 | Preparatory week before the final Exam |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس |                                                                                                           |                           |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------|
|                                                          | Text                                                                                                      | Available in the Library? |
| Required Texts                                           | University Physics Volume 1 by Samuel J. Ling                                                             | Yes                       |
| Recommended Texts                                        |                                                                                                           | No                        |
| Websites                                                 | <a href="https://www.coursera.org/search?query=physics">https://www.coursera.org/search?query=physics</a> |                           |

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

## نماذج وصف المواد الدراسية-المرحلة الثانية-قسم الهندسة المدنية

| Module Information                 |                                                  |                 |                                                                                                                                                                                                                                                                                                             |                   |     |
|------------------------------------|--------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----|
| معلومات المادة الدراسية            |                                                  |                 |                                                                                                                                                                                                                                                                                                             |                   |     |
| Module Title                       | <b>Building construction method and drawings</b> |                 | Module Delivery                                                                                                                                                                                                                                                                                             |                   |     |
| Module Type                        | Core                                             |                 | <div style="text-align: center;"> <input checked="" type="checkbox"/> Theory<br/> <input type="checkbox"/> Lecture<br/> <input checked="" type="checkbox"/> Lab<br/> <input type="checkbox"/> Tutorial<br/> <input type="checkbox"/> Practical<br/> <input type="checkbox"/> Seminar                 </div> |                   |     |
| Module Code                        | <b>CE228</b>                                     |                 |                                                                                                                                                                                                                                                                                                             |                   |     |
| ECTS Credits                       | 8                                                |                 |                                                                                                                                                                                                                                                                                                             |                   |     |
| SWL (hr/sem)                       | <b>200</b>                                       |                 |                                                                                                                                                                                                                                                                                                             |                   |     |
| Module Level                       |                                                  | 2               | Semester of Delivery                                                                                                                                                                                                                                                                                        |                   | 2   |
| Administering Department           |                                                  | Type Dept. Code | College                                                                                                                                                                                                                                                                                                     | Type College Code |     |
| Module Leader                      |                                                  |                 | e-mail                                                                                                                                                                                                                                                                                                      |                   |     |
| Module Leader's Acad. Title        |                                                  |                 | Module Leader's Qualification                                                                                                                                                                                                                                                                               |                   |     |
| Module Tutor                       |                                                  |                 | e-mail                                                                                                                                                                                                                                                                                                      | E-mail            |     |
| Peer Reviewer Name                 |                                                  | Name            | e-mail                                                                                                                                                                                                                                                                                                      | E-mail            |     |
| Scientific Committee Approval Date |                                                  | 01/09/2025      | Version Number                                                                                                                                                                                                                                                                                              |                   | 1.0 |

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

| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br><b>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</b> |                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br><b>أهداف المادة الدراسية</b>                                                                               | <ol style="list-style-type: none"> <li>1. Understanding the types of construction systems.</li> <li>2. The steps of starting and completing construction projects.</li> <li>3. Specifications and use of various construction equipment.</li> <li>4. The requirements and methods of implementation of projects.</li> <li>5. The general requirements and specifications of various construction works.</li> </ol> |
| <b>Module Learning Outcomes</b><br><b>مخرجات التعلم للمادة الدراسية</b>                                                          | <ol style="list-style-type: none"> <li>1. The ability to distinguish the type of construction system.</li> <li>2. Select the appropriate procedure to perform certain construction work.</li> <li>3. Select the most suitable equipment.</li> <li>4. Select the type of foundation.</li> <li>5. The knowledge required to distinguish the works that met the specifications.</li> </ol>                            |
| <b>Indicative Contents</b><br><b>المحتويات الإرشادية</b>                                                                         | <ol style="list-style-type: none"> <li>1. Types and development of buildings.</li> <li>2. Earthworks types and methods of implementation.</li> <li>3. Dewatering methods.</li> <li>4. Types and properties of foundations.</li> <li>5. Construction of walls</li> <li>6. Finishing</li> <li>7. Concrete works</li> <li>8. Joints types and methods of installation.</li> </ol>                                     |

| <b>Learning and Teaching Strategies</b><br><b>استراتيجيات التعلم والتعليم</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                             | <ol style="list-style-type: none"> <li>1. Encouraging students to participate in presenting opinions and ideas relating construction.</li> <li>2. Letting the students to select the right choice to perform certain construction work.</li> <li>3. Testing students' understanding by inviting them to participate by discovering the errors, mistakes, and disadvantages of the method of implementing a certain step within a construction project and suggesting the appropriate method.</li> </ol> |

| <b>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا</b>                                        |     |                                                                                  |      |
|---------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------|------|
| <b>Structured SWL (h/sem)</b><br><b>الحمل الدراسي المنتظم للطالب خلال الفصل</b>       | 114 | <b>Structured SWL (h/w)</b><br><b>الحمل الدراسي المنتظم للطالب أسبوعيا</b>       | 8    |
| <b>Unstructured SWL (h/sem)</b><br><b>الحمل الدراسي غير المنتظم للطالب خلال الفصل</b> | 86  | <b>Unstructured SWL (h/w)</b><br><b>الحمل الدراسي غير المنتظم للطالب أسبوعيا</b> | 5.73 |
| <b>Total SWL (h/sem)</b><br><b>الحمل الدراسي الكلي للطالب خلال الفصل</b>              | 200 |                                                                                  |      |

| Module Evaluation     |                 |             |                  |          |                           |
|-----------------------|-----------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |          |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 10% (10)         |          |                           |
|                       | Assignments     | 2           | 10% (10)         |          |                           |
|                       | Projects / Lab. | 1           | 10% (10)         |          |                           |
|                       | Report          | 1           | 10% (10)         |          |                           |
| Summative assessment  | Midterm Exam    | 2 hr        | 10% (10)         |          |                           |
|                       | Final Exam      | 2hr         | 50% (50)         | 16       | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                       |
|---------------------------------|---------------------------------------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                                                       |
|                                 | Material Covered                                                                      |
| Week 1                          | Introduction on building and construction projects                                    |
| Week 2                          | Earthworks and excavation using hand tools and the methods of supporting them.        |
| Week 3                          | Excavation with mechanical equipment, dewatering, earth filling, and compaction.      |
| Week 4                          | Shallow footings types and requirements.                                              |
| Week 5                          | Raft, buoyancy, and pier foundations and the settlement and vibration of foundations. |
| Week 6                          | Pile foundations types and methods of installation.                                   |
| Week 7                          | Concrete works details requirements and equipment.                                    |
| Week 8                          | Masonry works units' types and requirements.                                          |
| Week 9                          | Requirements and design of brick walls.                                               |
| Week 10                         | Frameworks and scaffolding                                                            |
| Week 11                         | Water and dump proofing                                                               |
| Week 12                         | Joints in buildings                                                                   |
| Week 13                         | Means of transition between levels.                                                   |
| Week 14                         | Beams, columns, and floor systems.                                                    |
| Week 15                         | Finishing works.                                                                      |
| Week 16                         | Preparatory week before the final Exam                                                |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                                         |
|-------------------------------------------------------------------------|---------------------------------------------------------|
|                                                                         | Material Covered                                        |
| <b>Week 1</b>                                                           | Site Inspection and Soil Sampling                       |
| <b>Week 2</b>                                                           | Setting Out and Layout of Buildings                     |
| <b>Week 3</b>                                                           | Excavation Works and Shoring Systems                    |
| <b>Week 4</b>                                                           | Concrete Mix Design, Slump Test, and Casting            |
| <b>Week 5</b>                                                           | Reinforcement Bars (Rebar) Cutting, Bending, and Fixing |
| <b>Week 6</b>                                                           | Formwork Assembly and Shuttering                        |
| <b>Week 7</b>                                                           | Brickwork and Blockwork Masonry Bonds                   |

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                                                                                                                                                                                                                                 |                           |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                                 | Text                                                                                                                                                                                                                                            | Available in the Library? |
| <b>Required Texts</b>                                           | Zuheir Sako and Artin Levon "Building construction (in Arabic)"                                                                                                                                                                                 | Yes                       |
| <b>Recommended Texts</b>                                        | 1. Edward Allen and Joseph Iano "Fundamentals of Building Construction Materials and Methods"<br>2. T.D. Ahuja and G.S. Birdi "CIVIL ENGINEERING building construction"<br>2.PURUSHOTHAMA RA J "Building Construction Materials and Techniques" | No                        |
| <b>Websites</b>                                                 |                                                                                                                                                                                                                                                 |                           |

| Module Information                 |                             |                               |                                                                                                                                                                                                      |  |
|------------------------------------|-----------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية            |                             |                               |                                                                                                                                                                                                      |  |
| Module Title                       | <b>Engineering Survey 1</b> |                               | Module Delivery                                                                                                                                                                                      |  |
| Module Type                        | Core                        |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical |  |
| Module Code                        | <b>CE215</b>                |                               |                                                                                                                                                                                                      |  |
| ECTS Credits                       | 4                           |                               |                                                                                                                                                                                                      |  |
| SWL (hr/sem)                       | <b>75</b>                   |                               |                                                                                                                                                                                                      |  |
| Module Level                       | 2                           | Semester of Delivery          | 1,2                                                                                                                                                                                                  |  |
| Administering Department           | Type Dept. Code             | College                       | Type College Code                                                                                                                                                                                    |  |
| Module Leader                      |                             | e-mail                        |                                                                                                                                                                                                      |  |
| Module Leader's Acad. Title        |                             | Module Leader's Qualification |                                                                                                                                                                                                      |  |
| Module Tutor                       |                             | e-mail                        |                                                                                                                                                                                                      |  |
| Peer Reviewer Name                 | Name                        | e-mail                        | E-mail                                                                                                                                                                                               |  |
| Scientific Committee Approval Date | 01/09/2025                  | Version Number                | 1.0                                                                                                                                                                                                  |  |

| Relation with other Modules       |                     |          |     |
|-----------------------------------|---------------------|----------|-----|
| العلاقة مع المواد الدراسية الأخرى |                     |          |     |
| Prerequisite module               | None                | Semester |     |
| Co-requisites module              | ENGINEERING DRAWING | Semester | 1-1 |

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

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                         | <p>The aim of this Module is to provide the student with a deep understanding of surveying and construction activities; practical application of topographic surveying skills, an awareness of the preliminary considerations involved in construction developments and a knowledge of the materials and procedures employed in construction of small commercial/industrial building works.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم<br>للمادة الدراسية | <ol style="list-style-type: none"> <li>1. Apply the basic surveying concepts, principles, and theories on distance and angular measurements as well as area computation.</li> <li>2. Solve distances, elevations, and areas from a provided set of survey data.</li> <li>3. Apply the basic surveying concepts, principles, and theories on determining horizontal and vertical distances using stadia.</li> <li>4. Compute the missing data from incomplete traverse data.</li> <li>5. Acquire a working knowledge of the design and layout of horizontal or vertical curves in highways or railways.</li> <li>6. Determine and use the appropriate methodology in calculating earthworks in various civil engineering constructions.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Indicative Contents</b>                                          | <p>LESSON 1: Introduction to Surveying a. Surveying Concepts b. Types of Surveys c. Importance of Surveying d. Surveying Equipment and Accessories e. Measurement f. Sources of Errors g. Errors and Mistakes h. Accuracy and Precision</p> <p>Distance Measurement a. Measurement of Horizontal Distance - Pacing - Taping - Tachymetry - Graphical &amp; Mathematical Method - Mechanical Devices - Photogrammetry b. Taping Over Level Ground Taping Along Sloping Ground</p> <p>LESSON 3: Distance Corrections a. Types of Correction b. Incorrect Tape Length c. Temperature Variations d. Slope Corrections e. Sag and Tension Corrections f. Combined Taping Corrections g. Errors in Taping h. Taping Precision</p> <p>LESSON 4: Leveling Methods a. Importance of Leveling b. Reference Elevations or Datums c. Types of Level d. Methods of Leveling e. Differential Leveling f. Leveling Errors g. Profile Leveling h. Profiles and Cross Sections</p> <p>LESSON 5: Angles and Directions Measurements a. Meridians b. Azimuth c. Bearings</p> <p>d. The Compass e. Local Attraction f. Traverse Angle Definitions g. Traverse Computations h. Transits and Theodolites i. Introduction to Total Stations j. Advantages and Disadvantages of Total Stations k. Surveying with Total Stations l. Measuring Horizontal Angles m. Closing the Horizon n. Measuring Zenith Angles</p> <p>CLO 1, 2, &amp; 3 Synchronous • Lesson 5: Angles and Direction Measurement Sample Problems • Discussion of QUIZ # 1 • Asynchronous • Lesson 5: Angles and Direction Measurement Asynchronous Seatwork # 4 Assignment # 4 5th</p> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Traverse Adjustment and Area Computation a. Methods of Calculating Areas b. Balancing Angles c. Latitudes and Departures d. Error of Closure e. Balancing Latitudes and Departures f. Double Meridian Distances g. Double Parallel Distances h. Rectangular Coordinates i. Areas Computed by Coordinates j. Areas Within Irregular Boundaries</p> <p>LESSON 8: Topographic Survey a. Introduction to Topographic Survey b. Contours c. Plotting of Contour Characteristics d. Map Symbols e. Transit-Stadia Method of Mapping f. Plane Table Surveys g. Profiles from Contour Maps h. The Stadia Theory</p> <p>a. Measurement by Stadia for Horizontal distances b. Measurement by Stadia for inclined Distance c. Sources of Error in stadia work.</p> <p>LESSON 9: Horizontal curves a. Simple Curve b. Compound Curve c. Reverse Curve Spiral Curve</p> <p>Lesson 10: Vertical Curves a. Symmetrical Parabolic Curve b. Unsymmetrical Parabolic Curve</p> |
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| <b>Learning and Teaching Strategies</b><br><b>استراتيجيات التعلم والتعليم</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                             | <p>Problem set assignments are due at the beginning of class. Homework can be turned in early if a student expects to be absent. • Guidelines for homework: a. All solutions will be submitted on 8 ½" x 11" paper. b. Solutions will be presented on one side of each sheet only. c. The first page will contain the following in the upper left margin: - Student's name - Student number - Course code and Course Title - Indicate the Problem set d. The final answer must be boxed together with the correct units. e. Clarity and neatness are vital. Points may be taken off for sloppiness.</p> |

| <b>Student Workload (SWL)</b><br><b>الحمل الدراسي للطلاب محسوب لـ 15 اسبوعا</b> |     |                                                                           |      |
|---------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|------|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل        | 128 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       | 9    |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل  | 97  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 6.46 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل               | 225 |                                                                           |      |

| <b>Module Evaluation</b><br><b>تقييم المادة الدراسية</b> |
|----------------------------------------------------------|
|----------------------------------------------------------|

|                      |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|----------------------|-----------------|-------------|------------------|----------|---------------------------|
| Formative assessment | Quizzes         | 2           | 10% (10)         | 3&9      | LO 1&2&3                  |
|                      | Assignments     | 2           | 10% (10)         | 5&13     | LO 2&5                    |
|                      | Projects / Lab. | 1           | 10% (10)         | 12       | LO 6                      |
|                      | Report          | 1           | 10% (10)         | 10       | LO 5 & 4                  |
| Summative assessment | Midterm Exam    | 2 hr        | 10% (10)         | 15       | All                       |
|                      | Final Exam      | 2hr         | 50% (50)         | 16       | All                       |
| Total assessment     |                 |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                   |
|---------------------------------|---------------------------------------------------|
| المناهج الاسبوعي النظري         |                                                   |
|                                 | Material Covered                                  |
| Week 1                          | Introduction to Surveying<br>Distance Measurement |
| Week 2                          | Distance Corrections                              |
| Week 3                          | Leveling Methods                                  |
| Week 4                          | Angles and Directions Measurements                |
| Week 5                          | Traverse Adjustment and Area Computation          |
| Week 6                          | Topographic Survey                                |
| Week 7                          | Topographic Survey                                |
| Week 8                          | Horizontal curves                                 |
| Week 9                          | Vertical Curves                                   |
| Week 10                         | Earthwork Operations & Mass Diagram               |
| Week 11                         | Earthwork Operations & Mass Diagram               |
| Week 12                         | Global Positioning System                         |
| Week 13                         | Satellite survey                                  |
| Week 14                         | GIS                                               |
| Week 15                         | GIS                                               |
| Week 16                         | Preparatory week before the final Exam            |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                  |
|-------------------------------------------------------------------------|------------------|
|                                                                         | Material Covered |
| Week 1                                                                  | Tape measurement |
| Week 2                                                                  | Tape measurement |
| Week 3                                                                  | Tape measurement |
| Week 4                                                                  | Leveling         |
| Week 5                                                                  | Leveling         |
| Week 6                                                                  | Leveling         |
| Week 7                                                                  | Theodolite       |
| Week 8                                                                  | Theodolite       |
| Week 9                                                                  | Total Station    |
| Week 10                                                                 | Total Station    |
| Week 11                                                                 | Total Station    |
| Week 12                                                                 | Total Station    |
| Week 13                                                                 | Total Station    |
| Week 14                                                                 | Total Station    |
| Week 15                                                                 | Total Station    |

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |      |                           |
|-----------------------------------------------------------------|------|---------------------------|
|                                                                 | Text | Available in the Library? |
| Required Texts                                                  |      | no                        |

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Recommended Texts</b> | 1. Surveying: Theory and Practice by James M. Anderson and Edward M. Mikhail, (7th Edition), 2002<br>2. Kavanagh, Barry F., Surveying: Principles and Applications (9th Edition), 2014<br>3. Kavanagh, Barry F., Surveying with Construction Applications (8th Edition), 2015<br>4. Ghilani, C.D., and Wolf, P.R., Elementary Surveying: An Introduction to Geomatics (13th Edition), 2011<br>5. Schofield W. and M. Breach, Engineering Surveying, (6th Edition), 2007<br>6. La Putt, J.P., Elementary Surveying (3rd Edition) 2013 Reprint<br>7. La Putt, J.P., Higher Surveying (2nd Edition) 2013 Reprint | No |
| <b>Websites</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |

| <b>Grading Scheme</b><br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                |                         |                    |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade                   | التقدير            | Marks (%) | Definition                            |
| <b>Success Group<br/>(50 - 100)</b>                                                                                                                                                                                                                                                                                                                                                  | <b>A</b> - Excellent    | امتياز             | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>B</b> - Very Good    | جدا جدا            | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>C</b> - Good         | جدا                | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>D</b> - Satisfactory | متوسط              | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>E</b> - Sufficient   | مقبول              | 50 - 59   | Work meets minimum criteria           |
| <b>Fail Group<br/>(0 – 49)</b>                                                                                                                                                                                                                                                                                                                                                       | <b>FX</b> – Fail        | راسب (قد المعالجة) | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>F</b> – Fail         | راسب               | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                         |                    |           |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                         |                    |           |                                       |

| Module Information                 |                              |                      |                                                                                                                                                                                                      |     |
|------------------------------------|------------------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| معلومات المادة الدراسية            |                              |                      |                                                                                                                                                                                                      |     |
| Module Title                       | <b>Engineering Survey II</b> |                      | Module Delivery                                                                                                                                                                                      |     |
| Module Type                        | Core                         |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical |     |
| Module Code                        | <b>CE215</b>                 |                      |                                                                                                                                                                                                      |     |
| ECTS Credits                       | 4                            |                      |                                                                                                                                                                                                      |     |
| SWL (hr/sem)                       | 75                           |                      |                                                                                                                                                                                                      |     |
| Module Level                       | 2                            | Semester of Delivery |                                                                                                                                                                                                      | 1,2 |
| Administering Department           | Type Dept. Code              | College              | Type College Code                                                                                                                                                                                    |     |
| Module Leader                      |                              |                      | e-mail                                                                                                                                                                                               |     |
| Module Leader's Acad. Title        |                              |                      | Module Leader's Qualification                                                                                                                                                                        |     |
| Module Tutor                       |                              |                      | e-mail                                                                                                                                                                                               |     |
| Peer Reviewer Name                 | Name                         | e-mail               | E-mail                                                                                                                                                                                               |     |
| Scientific Committee Approval Date | 01/09/2025                   | Version Number       | 1.0                                                                                                                                                                                                  |     |

| Relation with other Modules       |                     |          |     |
|-----------------------------------|---------------------|----------|-----|
| العلاقة مع المواد الدراسية الأخرى |                     |          |     |
| Prerequisite module               | None                | Semester |     |
| Co-requisites module              | ENGINEERING DRAWING | Semester | 1-1 |

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

|                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Aims</b><br/>أهداف المادة الدراسية</p>                      | <p>The aim of this Module is to provide the student with a deep understanding of surveying and construction activities; practical application of topographic surveying skills, an awareness of the preliminary considerations involved in construction developments and a knowledge of the materials and procedures employed in construction of small commercial/industrial building works.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <p><b>Module Learning Outcomes</b><br/>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>7. Apply the basic surveying concepts, principles, and theories on distance and angular measurements as well as area computation.</li> <li>8. Solve distances, elevations, and areas from a provided set of survey data.</li> <li>9. Apply the basic surveying concepts, principles, and theories on determining horizontal and vertical distances using stadia.</li> <li>10. Compute the missing data from incomplete traverse data.</li> <li>11. Acquire a working knowledge of the design and layout of horizontal or vertical curves in highways or railways.</li> <li>12. Determine and use the appropriate methodology in calculating earthworks in various civil engineering constructions.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p><b>Indicative Contents</b><br/>المحتويات الإرشادية</p>                | <p>LESSON 1: Introduction to Surveying a. Surveying Concepts b. Types of Surveys c. Importance of Surveying d. Surveying Equipment and Accessories e. Measurement f. Sources of Errors g. Errors and Mistakes h. Accuracy and Precision</p> <p>Distance Measurement a. Measurement of Horizontal Distance - Pacing - Taping - Tachymetry - Graphical &amp; Mathematical Method - Mechanical Devices - Photogrammetry b. Taping Over Level Ground Taping Along Sloping Ground</p> <p>LESSON 3: Distance Corrections a. Types of Correction b. Incorrect Tape Length c. Temperature Variations d. Slope Corrections e. Sag and Tension Corrections f. Combined Taping Corrections g. Errors in Taping h. Taping Precision</p> <p>LESSON 4: Leveling Methods a. Importance of Leveling b. Reference Elevations or Datums c. Types of Level d. Methods of Leveling e. Differential Leveling f. Leveling Errors g. Profile Leveling h. Profiles and Cross Sections</p> <p>LESSON 5: Angles and Directions Measurements a. Meridians b. Azimuth c. Bearings d. The Compass e. Local Attraction f. Traverse Angle Definitions g. Traverse Computations h. Transits and Theodolites i. Introduction to Total Stations j. Advantages and Disadvantages of Total Stations k. Surveying with Total Stations l. Measuring Horizontal Angles m. Closing the Horizon n. Measuring Zenith Angles CLO 1, 2, &amp; 3 Synchronous • Lesson 5: Angles and Direction Measurement Sample Problems • Discussion of QUIZ # 1 • Asynchronous • Lesson 5: Angles and Direction Measurement Asynchronous Seatwork # 4 Assignment # 4 5th</p> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Traverse Adjustment and Area Computation a. Methods of Calculating Areas b. Balancing Angles c. Latitudes and Departures d. Error of Closure e. Balancing Latitudes and Departures f. Double Meridian Distances g. Double Parallel Distances h. Rectangular Coordinates i. Areas Computed by Coordinates j. Areas Within Irregular Boundaries</p> <p>LESSON 8: Topographic Survey a. Introduction to Topographic Survey b. Contours c. Plotting of Contour Characteristics d. Map Symbols e. Transit-Stadia Method of Mapping f. Plane Table Surveys g. Profiles from Contour Maps h. The Stadia Theory a. Measurement by Stadia for Horizontal distances b. Measurement by Stadia for inclined Distance c. Sources of Error in stadia work.</p> <p>LESSON 9: Horizontal curves a. Simple Curve b. Compound Curve c. Reverse Curve Spiral Curve</p> <p>Lesson 10: Vertical Curves a. Symmetrical Parabolic Curve b. Unsymmetrical Parabolic Curve</p> |
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| <b>Learning and Teaching Strategies</b><br><b>استراتيجيات التعلم والتعليم</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                             | <p>Problem set assignments are due at the beginning of class. Homework can be turned in early if a student expects to be absent. • Guidelines for homework: a. All solutions will be submitted on 8 ½" x 11" paper. b. Solutions will be presented on one side of each sheet only. c. The first page will contain the following in the upper left margin: - Student's name - Student number - Course code and Course Title - Indicate the Problem set d. The final answer must be boxed together with the correct units. e. Clarity and neatness are vital. Points may be taken off for sloppiness.</p> |

| <b>Student Workload (SWL)</b><br><b>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا</b> |     |                                                                           |      |
|---------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|------|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل        | 128 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 9    |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل  | 97  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6.46 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل               | 225 |                                                                           |      |

| Module Evaluation     |                 |             |                  |          |                           |
|-----------------------|-----------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |          |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 10% (10)         | 3&9      | LO 1&2&3                  |
|                       | Assignments     | 2           | 10% (10)         | 5&13     | LO 2&5                    |
|                       | Projects / Lab. | 1           | 10% (10)         | 12       | LO 6                      |
|                       | Report          | 1           | 10% (10)         | 10       | LO 5 & 4                  |
| Summative assessment  | Midterm Exam    | 2 hr        | 10% (10)         | 15       | All                       |
|                       | Final Exam      | 2hr         | 50% (50)         | 16       | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                      |
|---------------------------------|------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                      |
|                                 | Material Covered                                     |
| Week 1                          | Sections                                             |
| Week 2                          | Longitudinal section adjustment                      |
| Week 3                          | Longitudinal section adjustment                      |
| Week 4                          | Longitudinal section adjustment                      |
| Week 5                          | Types of cross-sections                              |
| Week 6                          | Cross section adjustment                             |
| Week 7                          | Cross sectional calculations                         |
| Week 8                          | The theodolite                                       |
| Week 9                          | The leveling and horizontal adjustment of the device |
| Week 10                         | Inspecting and adjusting the theodolite device       |
| Week 11                         | The applications of the theodolite device            |
| Week 12                         | The applications of the theodolite device            |
| Week 13                         | The directions                                       |
| Week 14                         | Direction systems                                    |
| Week 15                         | Direction applications                               |
| Week 16                         | Preparatory week before the final Exam               |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                  |
|-------------------------------------------------------------------------|------------------|
|                                                                         | Material Covered |
| Week 1                                                                  | Tape measurement |
| Week 2                                                                  | Tape measurement |
| Week 3                                                                  | Tape measurement |
| Week 4                                                                  | Leveling         |
| Week 5                                                                  | Leveling         |
| Week 6                                                                  | Leveling         |
| Week 7                                                                  | Theodolite       |
| Week 8                                                                  | Theodolite       |
| Week 9                                                                  | Total Station    |
| Week 10                                                                 | Total Station    |
| Week 11                                                                 | Total Station    |
| Week 12                                                                 | Total Station    |
| Week 13                                                                 | Total Station    |
| Week 14                                                                 | Total Station    |
| Week 15                                                                 | Total Station    |

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |      |                           |
|-----------------------------------------------------------------|------|---------------------------|
|                                                                 | Text | Available in the Library? |
| Required Texts                                                  |      | no                        |

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |    |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Recommended Texts</b> | 8. Surveying: Theory and Practice by James M. Anderson and Edward M. Mikhail, (7th Edition), 2002<br>9. Kavanagh, Barry F., Surveying: Principles and Applications (9th Edition), 2014<br>10. Kavanagh, Barry F., Surveying with Construction Applications (8th Edition), 2015<br>11. Ghilani, C.D., and Wolf, P.R., Elementary Surveying: An Introduction to Geomatics (13th Edition), 2011<br>12. Schofield W. and M. Breach, Engineering Surveying, (6th Edition), 2007<br>13. La Putt, J.P., Elementary Surveying (3rd Edition) 2013 Reprint<br>14. La Putt, J.P., Higher Surveying (2nd Edition) 2013 Reprint | No |
| <b>Websites</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |    |

| <b>Grading Scheme</b><br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                |                         |                    |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade                   | التقدير            | Marks (%) | Definition                            |
| <b>Success Group<br/>(50 - 100)</b>                                                                                                                                                                                                                                                                                                                                                  | <b>A</b> - Excellent    | امتاز              | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>B</b> - Very Good    | جدا جدا            | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>C</b> - Good         | جدا                | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>D</b> - Satisfactory | متوسط              | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>E</b> - Sufficient   | مقبول              | 50 - 59   | Work meets minimum criteria           |
| <b>Fail Group<br/>(0 – 49)</b>                                                                                                                                                                                                                                                                                                                                                       | <b>FX</b> – Fail        | راسب (قد المعالجة) | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>F</b> – Fail         | راسب               | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                         |                    |           |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                         |                    |           |                                       |

| Module Information                 |                          |                      |                                                                                                                                                                                                                                          |        |
|------------------------------------|--------------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| معلومات المادة الدراسية            |                          |                      |                                                                                                                                                                                                                                          |        |
| Module Title                       | <b>Fluid Mechanics I</b> |                      | Module Delivery                                                                                                                                                                                                                          |        |
| Module Type                        | Core                     |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |        |
| Module Code                        | <b>CE214</b>             |                      |                                                                                                                                                                                                                                          |        |
| ECTS Credits                       | 5                        |                      |                                                                                                                                                                                                                                          |        |
| SWL (hr/sem)                       | <b>75</b>                |                      |                                                                                                                                                                                                                                          |        |
| Module Level                       | 2                        | Semester of Delivery |                                                                                                                                                                                                                                          | 1,2    |
| Administering Department           | Type Dept. Code          | College              | Type College Code                                                                                                                                                                                                                        |        |
| Module Leader                      |                          |                      | e-mail                                                                                                                                                                                                                                   | E-mail |
| 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 | 01/09/2025               |                      | Version Number                                                                                                                                                                                                                           | 1.0    |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                     |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | 1- To develop problem solving skills and understanding of Fluid Mechanics in civil engineering.<br>2- This course deals with the basic concepts of Fluid Mechanics.<br>3- This is the basic subject for all electrical and electronic circuits.<br>4- 4- To understand viscous fluid flow problems. |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | 1- To understand general principles of fluid mechanics<br>2- To understand incompressible and compressible flow<br>3- To understand flow through pipes and open channel                                                                                                                                                                                                                                |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | This module covers a wide range of topics of fluid mechanics in order to offer basic knowledge and foundations applicable to various civil engineering problems. This module introduces fundamental of conservation (mass, momentum and energy) laws of fluid flow, potential (ideal) flow, inviscid compressible flow and viscous flow. This module is also complemented by lab classes and tutorials |

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

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |      |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|------|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 128 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب اسبوعيا       | 9    |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 97  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب اسبوعيا | 6.46 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 225 |                                                                           |      |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                 |             |                  |          |                           |
|---------------------------------------------------|-----------------|-------------|------------------|----------|---------------------------|
|                                                   |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | Quizzes         | 2           | 10% (10)         |          |                           |
|                                                   | Assignments     | 2           | 10% (10)         |          |                           |
|                                                   | Projects / Lab. | 1           | 10% (10)         |          |                           |
|                                                   | Report          | 1           | 10% (10)         |          |                           |
| <b>Summative assessment</b>                       | Midterm Exam    | 2 hr        | 10% (10)         |          |                           |
|                                                   | Final Exam      | 2hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>                           |                 |             | 100% (100 Marks) |          |                           |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                                             |
|-------------------------------------------------------------------|-------------------------------------------------------------|
|                                                                   | Material Covered                                            |
| <b>Week 1</b>                                                     | Fluid Properties and Units and Dimensions                   |
| <b>Week 2</b>                                                     | Fluid pressure and its measurements                         |
| <b>Week 3</b>                                                     | Hydrostatic forces on surfaces: plane Surfaces              |
| <b>Week 4</b>                                                     | Hydrostatic forces on surfaces: Non plane Surfaces          |
| <b>Week 5</b>                                                     | Buoyancy and floatation                                     |
| <b>Week 6</b>                                                     | Kinematics and dynamics of fluid flow, Bernoulli's equation |
| <b>Week 7</b>                                                     | Fluids Subjected to constant acceleration                   |
| <b>Week 8</b>                                                     | Applications of Bernoulli's equation                        |
| <b>Week 9</b>                                                     | Discharge measurements                                      |
| <b>Week 10</b>                                                    | Momentum equation                                           |
| <b>Week 11</b>                                                    | Laminar and turbulent flow                                  |
| <b>Week 12</b>                                                    | Flow through pipes, Major and minor head losses             |
| <b>Week 13</b>                                                    | Flow through pipes, Major and minor head losses             |
| <b>Week 14</b>                                                    | Open channel flow                                           |
| <b>Week 15</b>                                                    | Open channel flow                                           |
| <b>Week 16</b>                                                    | <b>Preparatory week before the final Exam</b>               |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                                    |
|-------------------------------------------------------------------------|----------------------------------------------------|
|                                                                         | Material Covered                                   |
| <b>Week 1</b>                                                           | Some Physical Properties of Fluids                 |
| <b>Week 2</b>                                                           | Fluid Pressure at a Point                          |
| <b>Week 3</b>                                                           | Simple Manometers, Differential Manometers         |
| <b>Week 4</b>                                                           | Hydrostatic Forces on Submerged Surfaces           |
| <b>Week 5</b>                                                           | Impulse Momentum Equation                          |
| <b>Week 6</b>                                                           | Types of Resistances and Losses of Energy in Pipes |
| <b>Week 7</b>                                                           | Flow Measuring Devices                             |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس |                                    |                           |
|----------------------------------------------------------|------------------------------------|---------------------------|
|                                                          | Text                               | Available in the Library? |
| Required Texts                                           | Fluid Mechanics, Streeter          | Yes                       |
| Recommended Texts                                        | Fluid Mechanics, White, F.M., 2016 | No                        |
| Websites                                                 |                                    |                           |

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

| Module Information                 |                           |                      |                                                                                                                                                                                                                                          |        |
|------------------------------------|---------------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| معلومات المادة الدراسية            |                           |                      |                                                                                                                                                                                                                                          |        |
| Module Title                       | <b>Fluid Mechanics II</b> |                      | Module Delivery                                                                                                                                                                                                                          |        |
| Module Type                        | Core                      |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |        |
| Module Code                        | <b>CE214</b>              |                      |                                                                                                                                                                                                                                          |        |
| ECTS Credits                       | 5                         |                      |                                                                                                                                                                                                                                          |        |
| SWL (hr/sem)                       | <b>75</b>                 |                      |                                                                                                                                                                                                                                          |        |
| Module Level                       | 2                         | Semester of Delivery |                                                                                                                                                                                                                                          | 1,2    |
| Administering Department           | Type Dept. Code           | College              | Type College Code                                                                                                                                                                                                                        |        |
| Module Leader                      |                           |                      | e-mail                                                                                                                                                                                                                                   | E-mail |
| 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 | 01/09/2025                | Version Number       | 1.0                                                                                                                                                                                                                                      |        |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                     |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | 5- To develop problem solving skills and understanding of Fluid Mechanics in civil engineering.<br>6- This course deals with the basic concepts of Fluid Mechanics.<br>7- This is the basic subject for all electrical and electronic circuits.<br>8- 4- To understand viscous fluid flow problems. |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | 4- To understand general principles of fluid mechanics<br>5- To understand incompressible and compressible flow<br>6- To understand flow through pipes and open channel                                                                                                                                                                                                                                |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | This module covers a wide range of topics of fluid mechanics in order to offer basic knowledge and foundations applicable to various civil engineering problems. This module introduces fundamental of conservation (mass, momentum and energy) laws of fluid flow, potential (ideal) flow, inviscid compressible flow and viscous flow. This module is also complemented by lab classes and tutorials |

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

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |      |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|------|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 128 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب اسبوعيا       | 9    |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 97  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب اسبوعيا | 6.46 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 225 |                                                                           |      |

| Module Evaluation     |                 |             |                  |          |                           |
|-----------------------|-----------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |          |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 10% (10)         |          |                           |
|                       | Assignments     | 2           | 10% (10)         |          |                           |
|                       | Projects / Lab. | 1           | 10% (10)         |          |                           |
|                       | Report          | 1           | 10% (10)         |          |                           |
| Summative assessment  | Midterm Exam    | 2 hr        | 10% (10)         |          |                           |
|                       | Final Exam      | 2hr         | 50% (50)         | 16       | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                       |
|---------------------------------|-----------------------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                                       |
|                                 | Material Covered                                                      |
| Week 1                          | Applications of Bernoulli's Equation                                  |
| Week 2                          | Applications of Bernoulli's Equation                                  |
| Week 3                          | Applications of Bernoulli's Equation                                  |
| Week 4                          | Measurement of Flow                                                   |
| Week 5                          | Measurement of Flow                                                   |
| Week 6                          | Momentum equation                                                     |
| Week 7                          | Laminar and turbulent flow                                            |
| Week 8                          | Laminar and turbulent flow                                            |
| Week 9                          | Flow through the pipes and the primary and secondary losses in energy |
| Week 10                         | Flow through the pipes and the primary and secondary losses in energy |
| Week 11                         | Flow through the pipes and the primary and secondary losses in energy |
| Week 12                         | Flow through the pipes and the primary and secondary losses in energy |
| Week 13                         | Flow in open channels                                                 |
| Week 14                         | Flow in open channels                                                 |
| Week 15                         | Flow in open channels                                                 |
| Week 16                         | Preparatory week before the final Exam                                |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|               | Material Covered                                   |
|---------------|----------------------------------------------------|
| <b>Week 1</b> | Some Physical Properties of Fluids                 |
| <b>Week 2</b> | Fluid Pressure at a Point                          |
| <b>Week 3</b> | Simple Manometers, Differential Manometers         |
| <b>Week 4</b> | Hydrostatic Forces on Submerged Surfaces           |
| <b>Week 5</b> | Impulse Momentum Equation                          |
| <b>Week 6</b> | Types of Resistances and Losses of Energy in Pipes |
| <b>Week 7</b> | Flow Measuring Devices                             |

### Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                               | Available in the Library? |
|--------------------------|------------------------------------|---------------------------|
| <b>Required Texts</b>    | Fluid Mechanics, Streeter          | Yes                       |
| <b>Recommended Texts</b> | Fluid Mechanics, White, F.M., 2016 | No                        |
| <b>Websites</b>          |                                    |                           |

### Grading Scheme

مخطط الدرجات

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

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

| Module Information                 |                 |                               |                                                                                                                                                                                                                               |
|------------------------------------|-----------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                 |                               |                                                                                                                                                                                                                               |
| Module Title                       | Arabic          |                               | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | Supported       |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | 216 AL          |                               |                                                                                                                                                                                                                               |
| ECTS Credits                       | 2               |                               |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | 30              |                               |                                                                                                                                                                                                                               |
| Module Level                       | 2               | Semester of Delivery          | 2                                                                                                                                                                                                                             |
| Administering Department           | Type Dept. Code | College                       | Type College Code                                                                                                                                                                                                             |
| Module Leader                      |                 | e-mail                        |                                                                                                                                                                                                                               |
| Module Leader's Acad. Title        |                 | Module Leader's Qualification |                                                                                                                                                                                                                               |
| Module Tutor                       |                 | e-mail                        | E-mail                                                                                                                                                                                                                        |
| Peer Reviewer Name                 | Name            | e-mail                        | E-mail                                                                                                                                                                                                                        |
| Scientific Committee Approval Date | 01/09/2025      | Version Number                | 1.0                                                                                                                                                                                                                           |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                    |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                    |
| Module Aims<br>أهداف المادة الدراسية                     | 8- Educating students about the nature of linguistics and assisting them in correct expression.<br>9- Regulating language styles and uncovering its secrets.<br>10- Equipping students with linguistic abilities that enable them to correct their |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | <p>speech while reading.</p> <p>11- Developing students' linguistic, grammatical, and spelling skills.</p> <p>12- Understanding sentence structures and their different styles.</p> <p>13- Correcting mistakes arising from linguistic errors in pronunciation or writing.</p> <p>14- Introducing punctuation marks and how to use them.</p>                                                                           |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | <p>4- Establish a solid foundation in knowledge and linguistic thought for students in scientific disciplines, both human and scientific.</p> <p>5- Maintain the integrity of the Arabic language.</p> <p>6- Evaluate the language of researchers in preparing master's theses and doctoral dissertations, as well as the language of book authorship in accordance with the correct rules of the Arabic language.</p> |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                |                                                                                                                                                                                                                                                                                                                                                                                                                        |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>5-Conduct linguistic research that serves the language of the Holy Quran and legal arguments as a living means of expressing ideas.</p> <p>6-Train the mind in scientific analysis, which is part of the levels of thinking.</p> <p>7-Use multiple teaching methods to equip students with the ability to grasp the curriculum.</p> <p>8- Develop the student's ability to choose topics that address contemporary intellectual problems.</p> |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 58  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 42  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 2.8 |
| <b>Total SWL (h/sem)</b><br>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)         |          |                           |
|                       | Assignments  | 8           | 20% (20)         |          |                           |
|                       | Seminar      | 1           | 10% (10)         |          |                           |
| Summative assessment  | Midterm Exam | 2 hr        | 10% (10)         |          |                           |
|                       | Final Exam   | 2hr         | 50% (50)         | 16       | All                       |
| Total assessment      |              |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                        |
|---------------------------------|------------------------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                                        |
|                                 | Material Covered                                                       |
| Week 1                          | The Arabic language and its position in global linguistics             |
| Week 2                          | Speech and its components Categories of speech                         |
| Week 3                          | Noun - Signs of the noun                                               |
| Week 4                          | Verb - Signs of the verb                                               |
| Week 5                          | Part - Signs of the part                                               |
| Week 6                          | Spelling and writing rules: Origins and development                    |
| Week 7                          | Spelling rules and written expression: Origin and development          |
| Week 8                          | Rules for controlling the initial hamzah: 1- The hamzah of connection. |
| Week 9                          | 2- Hamzat al-Qat' 3- Hamzat al-Estifham                                |
| Week 10                         | Rules for controlling the medial hamza                                 |
| Week 11                         | Rules for controlling the extreme                                      |
| Week 12                         | Rules for controlling the letter 'Alif'                                |
| Week 13                         | Punctuation Marks - History - Origin and Development                   |
| Week 14                         | Modern punctuation marks                                               |
| Week 15                         | Review                                                                 |
| Week 16                         | Preparatory week before the final Exam                                 |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                        | Available in the Library? |
|--------------------------|-------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | Lectures and handouts                                       | No                        |
| <b>Recommended Texts</b> | Books on linguistics, grammar, and orthographic conventions | Yes                       |
| <b>Websites</b>          |                                                             |                           |

## Grading Scheme

مخطط الدرجات

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

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

| Module Information                 |                             |                     |                                                                                                                                                                                                                                          |                               |        |
|------------------------------------|-----------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------|
| معلومات المادة الدراسية            |                             |                     |                                                                                                                                                                                                                                          |                               |        |
| Module Title                       | <b>Computer programming</b> |                     | Module Delivery                                                                                                                                                                                                                          |                               |        |
| Module Type                        | Supportive                  |                     | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                               |        |
| Module Code                        | <b>CE217</b>                |                     |                                                                                                                                                                                                                                          |                               |        |
| ECTS Credits                       | 2                           |                     |                                                                                                                                                                                                                                          |                               |        |
| SWL (hr/sem)                       | <b>30</b>                   |                     |                                                                                                                                                                                                                                          |                               |        |
| Module Level                       |                             | 3                   | Semester of Delivery                                                                                                                                                                                                                     |                               | 1,2    |
| Administering Department           |                             | Type Dept. Code     | College                                                                                                                                                                                                                                  | Type College Code             |        |
| Module Leader                      |                             |                     |                                                                                                                                                                                                                                          | e-mail                        |        |
| 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 |                             | 01/09/2025          |                                                                                                                                                                                                                                          | Version Number                | 1.0    |

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

| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                                                                               | <p>Fortran is a general-purpose programming language mainly used by the scientific community. It is fast, and portable and it has seamless handling of arrays and parallelism. It is one of the earliest high level programming languages, and many recognize the original versions which used punched cards to encode the programs. Its name is a contraction of FORMula TRANslation (old versions of the language are typically stylized as FORTRAN) and its creation marked the representation of mathematical expressions with more ease than lower-level assembly language. It is still widely used today in numerical weather prediction, physical and chemical modelling, applied mathematics, and other high- performance computing purposes. Fortran has a rich array of mathematical libraries and scientific codebases available. The newer standards continuously add modern functionality and are fully backward compatible.</p> |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية                                                          | <p>A- Knowledge and Understanding</p> <ol style="list-style-type: none"> <li>1- Familiarity with the programming language FORTRAN.</li> <li>2- Learn how to write the program in the FORTRAN language.</li> <li>3- Applying several engineering programs using the FORTRAN programming language.</li> <li>4- Use physical problem using FORTRAN</li> <li>5- Identify the variables and constants in the programming language.</li> <li>6- Identify loops, arrays, and subprograms.</li> </ol> <p>B. Subject-specific skills</p> <ol style="list-style-type: none"> <li>1- Writing an engineering program in Fortran.</li> <li>2- Convert any problem to a program written in Fortran.</li> <li>3- Reserving locations for engineering data in the program's memory and using them.</li> <li>4- Linking information to engineering reality.</li> </ol>                                                                                         |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| <b>Learning and Teaching Strategies</b><br><b>استراتيجيات التعلم والتعليم</b> |                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                             | Weekly homework and sudden daily and weekly tests. Giving homework and activities in the classroom. As well as guiding students to important scientific sources and taking some exercises to train on them. The practical side also contributes to applied knowledge. |

| <b>Student Workload (SWL)</b><br><b>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا</b> |     |                                                                           |     |
|---------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل        | 58  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل  | 42  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 2.8 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل               | 100 |                                                                           |     |

| <b>Module Evaluation</b><br><b>تقييم المادة الدراسية</b> |                        |             |                  |          |                           |
|----------------------------------------------------------|------------------------|-------------|------------------|----------|---------------------------|
|                                                          |                        | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| <b>Formative assessment</b>                              | <b>Quizzes</b>         | 2           | 10% (10)         |          |                           |
|                                                          | <b>Assignments</b>     | 2           | 10% (10)         |          |                           |
|                                                          | <b>Projects / Lab.</b> | 1           | 10% (10)         |          |                           |
|                                                          | <b>Report</b>          | 1           | 10% (10)         |          |                           |
| <b>Summative assessment</b>                              | <b>Midterm Exam</b>    | 2 hr        | 10% (10)         |          |                           |
|                                                          | <b>Final Exam</b>      | 2hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>                                  |                        |             | 100% (100 Marks) |          |                           |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                                                                          |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|                                                                   | Material Covered                                                                         |
| <b>Week 1</b>                                                     | Introduction to the Fortran language Program( initialization section, program structure) |
| <b>Week 2</b>                                                     | Variables and constants ( how to write variables and constants)                          |
| <b>Week 3</b>                                                     | Inputs and outputs (how to start writing inputs and outputs )                            |
| <b>Week 4</b>                                                     | GOTO and FORMAT (statement and its types)                                                |
| <b>Week 5</b>                                                     | Control statement (recognize control statement )                                         |
| <b>Week 6</b>                                                     | DO loop statements ( use Loop rules )                                                    |
| <b>Week 7</b>                                                     | IF statements and their types (Arithmetic and Boolean IF statements)                     |
| <b>Week 8</b>                                                     | Relationship rules and examples ( some relationships between DO and IF)                  |
| <b>Week 9</b>                                                     | Multiple selected examples (A collection of examples )                                   |
| <b>Week 10</b>                                                    | A collection of notes, general summaries of the previous chapters                        |
| <b>Week 11</b>                                                    | Introduction and properties of ARRAYS                                                    |
| <b>Week 12</b>                                                    | DIMENSION statement rules                                                                |
| <b>Week 13</b>                                                    | Using more than one method for reading and printing Reading and printing Arrays          |
| <b>Week 14</b>                                                    | Where statement selects the domain of the matrix                                         |
| <b>Week 15</b>                                                    | External and internal functions Sub Routines                                             |
| <b>Week 16</b>                                                    | <b>Preparatory week before the final Exam</b>                                            |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                                            |
|-------------------------------------------------------------------------|------------------------------------------------------------|
|                                                                         | Material Covered                                           |
| <b>Week 1</b>                                                           | Learn how to operate a computer with FORTRAN software      |
| <b>Week 2</b>                                                           | Application on Variables and constants in FORTRAN language |

|                |                                                                               |
|----------------|-------------------------------------------------------------------------------|
| <b>Week 3</b>  | Start writing inputs and outputs in FORTRAN language with application         |
| <b>Week 4</b>  | Use GOTO and FORMAT statements with examples in Lab.                          |
| <b>Week 5</b>  | Application of Control statements                                             |
| <b>Week 6</b>  | Learn to use DO loop statements and its rules in computer                     |
| <b>Week 7</b>  | Apply IF statements and their types in PC.                                    |
| <b>Week 8</b>  | Use some relationships between DO and IF statements in the Lab.               |
| <b>Week 9</b>  | A collection of examples for civil engineering application part1              |
| <b>Week 10</b> | A collection of examples for civil engineering application part2              |
| <b>Week 11</b> | Use ARRAYS in the Lab. For Fortran language                                   |
| <b>Week 12</b> | Apply DIMENSION statement rules                                               |
| <b>Week 13</b> | Applications for students                                                     |
| <b>Week 14</b> | Use Where statement and apply it                                              |
| <b>Week 15</b> | Learn how to use External and internal functions Sub Routines and application |

| <b>Learning and Teaching Resources</b><br><b>مصادر التعلم والتدريس</b> |                                                                                                            |                                  |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                                                        | <b>Text</b>                                                                                                | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                                  | FORTRAN FOR SCIENTISTS & ENGINEERS 4th Edition, by Stephen Chapman                                         | --                               |
| <b>Recommended Texts</b>                                               | Computing for Scientists: Principles of Programming with Fortran 90 and C++<br>R. J. Barlow, A. R. Barnett | --                               |
| <b>Websites</b>                                                        | <a href="https://fortran-lang.org/en/learn/">https://fortran-lang.org/en/learn/</a>                        |                                  |

| Module Information                 |                            |                               |                                                                                                                                                                                                                                                                        |  |
|------------------------------------|----------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية            |                            |                               |                                                                                                                                                                                                                                                                        |  |
| Module Title                       | <b>Applied mathematics</b> |                               | Module Delivery                                                                                                                                                                                                                                                        |  |
| Module Type                        | Basic                      |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><br><input type="checkbox"/> Lab<br><input checked="" type="checkbox"/> Tutorial<br><br><input type="checkbox"/> Practical<br><input checked="" type="checkbox"/> Seminar |  |
| Module Code                        | <b>E212</b>                |                               |                                                                                                                                                                                                                                                                        |  |
| ECTS Credits                       | 8                          |                               |                                                                                                                                                                                                                                                                        |  |
| SWL (hr/sem)                       | <b>120</b>                 |                               |                                                                                                                                                                                                                                                                        |  |
| Module Level                       | 2                          | Semester of Delivery          | 1                                                                                                                                                                                                                                                                      |  |
| Administering Department           | Type Dept. Code            | College                       | Type College Code                                                                                                                                                                                                                                                      |  |
| Module Leader                      | Nabil Najm                 |                               | e-mail                                                                                                                                                                                                                                                                 |  |
| Module Leader's Acad. Title        |                            | Module Leader's Qualification |                                                                                                                                                                                                                                                                        |  |
| Module Tutor                       |                            | e-mail                        |                                                                                                                                                                                                                                                                        |  |
| Peer Reviewer Name                 | Name                       | e-mail                        | E-mail                                                                                                                                                                                                                                                                 |  |
| Scientific Committee Approval Date | 01/09/2025                 | Version Number                | 1.0                                                                                                                                                                                                                                                                    |  |

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

| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br><b>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br><b>أهداف المادة الدراسية</b>                                                                               | <p>The course aims to;</p> <ol style="list-style-type: none"> <li>1- Presenting polar coordinates and their applications in engineering</li> <li>2- Presenting vectors and their applications in engineering</li> <li>3- Presenting series and their applications in engineering</li> <li>4- Presenting partial derivatives and their applications in engineering</li> <li>5- Presenting multiple integral and their applications in engineering</li> <li>6- Presenting complex numbers and their applications in engineering</li> </ol>                                                                                                                                                                                                                                                                                                                                                          |
| <b>Module Learning Outcomes</b><br><b>مخرجات التعلم للمادة الدراسية</b>                                                          | <p>Knowledge and Understanding</p> <ol style="list-style-type: none"> <li>1- Understanding polar coordinates and their relation to Cartesian coordinates and their applications.</li> <li>2- Studying vectors and use them to study the analytic geometry of space with their important applications in engineering.</li> <li>3- Studying different types of series and their applications in solving different engineering and mathematical problems</li> <li>4- Using partial differentiation in deriving different surface equations, rate of change, optimization problem and estimation of change.</li> <li>5- Studying and using multiple integral and their applications in civil engineering such as determining areas, volumes, center of masses and moments of inertia.</li> <li>6- Studying complex numbers and their relations in solving different mathematical problems.</li> </ol> |
| <b>Indicative Contents</b><br><b>المحتويات الإرشادية</b>                                                                         | <ul style="list-style-type: none"> <li>- Graphing in Polar coordinates, calculating areas and lengths of curves using polar coordinates.</li> <li>- Study the analytic geometry of space using vectors. Vectors provide simple ways to define equations for lines, planes, curves, and surfaces in space with their many important applications in science, engineering.</li> <li>- study partial derivatives for the functions of two or multiple variables, chain rules, directional derivatives and critical points.</li> <li>- Study the multiple integrals in Cartesian and polar coordinates and area, volume, centroid and moment of inertia calculations using multiple integrals.</li> </ul>                                                                                                                                                                                             |

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 102 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 7   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 98  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6.5 |
| <b>Total SWL (h/sem)</b><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, 4, 5           |
|                       | Assignments  | 2           | 10% (10)         | 4, 9     | LO # 1, 2, 4, 5           |
|                       | Report       | 1           | 10% (10)         | 13       | LO # 3, 6                 |
| Summative assessment  | Midterm Exam | 2 hr        | 20% (20)         | 7        | LO # 1,2,3                |
|                       | Final Exam   | 2hr         | 50% (50)         | 16       | All                       |
| Total assessment      |              |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                                                                            |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                                                                                                            |
|                                 | Material Covered                                                                                                                           |
| <b>Week 1</b>                   | Definition of Polar Coordinates, Polar Equations and Graphs, Relating Polar and Cartesian Coordinates, Graphing Polar Coordinate Equations |
| <b>Week 2</b>                   | Areas and Lengths in Polar Coordinates                                                                                                     |
| <b>Week 3</b>                   | Vectors and the Geometry of Space, Component Form and Vector Algebra Operations                                                            |
| <b>Week 4</b>                   | Unit Vectors, Midpoint of a Line Segment, Navigation, forces action on a single object                                                     |
| <b>Week 5</b>                   | The Dot Product, Angle Between Vectors, orthogonal Vectors, work and Vector Projections                                                    |
| <b>Week 6</b>                   | The Cross Product, Calculating the Cross Product as a determinant, Area of a Parallelogram and Torque, Lines and Planes in Space           |
| <b>Week 7</b>                   | Infinite Sequences and Series, Infinite Series, Taylor and Maclaurin Series,                                                               |
| <b>Week 8</b>                   | Power Series, The Binomial Series and Applications of Taylor Series                                                                        |

|                |                                                                                                                                                                            |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 9</b>  | Partial Derivatives, Limits and Continuity in Higher Dimensions, Partial Derivatives of a Function of Two and Three Variables Second-Order and higher Partial Derivatives. |
| <b>Week 10</b> | The Chain Rule, Directional Derivatives and Gradient Vectors, Tangent Planes and Differentials, Estimating Change in a Specific Direction                                  |
| <b>Week 11</b> | Extreme Values and Saddle Points, optimization                                                                                                                             |
| <b>Week 12</b> | Double Integrals in Cartesian and Polar Form, Area by Double Integration                                                                                                   |
| <b>Week 13</b> | Triple Integrals, Area, volume, centroid and moment of inertia                                                                                                             |
| <b>Week 14</b> | Triple Integrals in Cylindrical and Spherical Coordinates                                                                                                                  |
| <b>Week 15</b> | Complex Numbers, Argand Diagrams, Euler's Formula, Operations on complex number                                                                                            |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                                                                                              |

| <b>Learning and Teaching Resources</b><br><b>مصادر التعلم والتدريس</b> |                                    |                                  |
|------------------------------------------------------------------------|------------------------------------|----------------------------------|
|                                                                        | <b>Text</b>                        | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                                  | Thomas' Calculus, George B. Thomas | Yes                              |
| <b>Recommended Texts</b>                                               | Calculus , STANLEY I. CROSSMAN     | No                               |
| <b>Websites</b>                                                        |                                    |                                  |

| Module Information                 |                          |                               |                                                                                                                                                                                                                               |
|------------------------------------|--------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                          |                               |                                                                                                                                                                                                                               |
| Module Title                       | <b>Baath Party Crime</b> |                               | Module Delivery                                                                                                                                                                                                               |
| Module Type                        |                          |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>CE219</b>             |                               |                                                                                                                                                                                                                               |
| ECTS Credits                       | <b>4</b>                 |                               |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | <b>45</b>                |                               |                                                                                                                                                                                                                               |
| Module Level                       | 2                        | Semester of Delivery          | 1,2                                                                                                                                                                                                                           |
| Administering Department           | Type Dept. Code          | College                       | Type College Code                                                                                                                                                                                                             |
| Module Leader                      |                          | e-mail                        |                                                                                                                                                                                                                               |
| 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 | 01/09/2025               | Version Number                | 1.0                                                                                                                                                                                                                           |

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

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

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | The basic objective is to introduce the student to The course aims to introduce the student to the crimes committed by the former regime during its era, which extended for thirty-five years, especially the crimes committed against members of the Shiite sect.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | Apply the knowledge of fundamental sciences mainly mathematics and physics to identify, formulate and solve civil engineering problems including stress, strain and deflection calculations as well as calculating axial force, shear and bending moment diagrams used in civil engineering analysis and design                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | The objectives of CE213, Strength of Materials, are to learn the principles of mechanics applied to different materials [III] and to develop problem solving skills through application of these principles to basic engineering problems. Specific topics covered in this class include: behavior of axially loaded members; torsion of circular shafts; stresses and deflections in beams; connectors in built-up beams; stress transformation under rotation of axes; principal stresses; triaxial stress and maximum shear stress; pressure vessels; and buckling behavior of columns. The course will rely on students' prerequisite knowledge of mathematics and basic science [II] in developing principles and analytical techniques of mechanics of materials. |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                        |
|------------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | Interactive daily lectures<br>Daily oral exams<br>Weekly written exams |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا |     |                                                                     |   |
|--------------------------------------------------------------------------|-----|---------------------------------------------------------------------|---|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل | 128 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب اسبوعيا | 9 |

|                                                                                |     |                                                                           |      |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|------|
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 97  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب اسبوعيا | 6.46 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 225 |                                                                           |      |

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

| <b>Delivery Plan (Weekly Syllabus)</b><br>المناهج الاسبوعي النظري |                                                                   |
|-------------------------------------------------------------------|-------------------------------------------------------------------|
|                                                                   | Material Covered                                                  |
| <b>Week 1</b>                                                     | Grammar of the Baath regime throughout the history of government  |
| <b>Week 2</b>                                                     | The position of the Supreme Criminal Court on Baathist violations |
| <b>Week 3</b>                                                     | The concept of crimes and their types                             |
| <b>Week 4</b>                                                     | Crime departments                                                 |
| <b>Week 5</b>                                                     | The concept of crimes and their types                             |
| <b>Week 6</b>                                                     | Psychological crimes and their effects                            |
| <b>Week 7</b>                                                     | Social crimes                                                     |
| <b>Week 8</b>                                                     | Violations of Iraqi laws                                          |

|                |                                                                      |
|----------------|----------------------------------------------------------------------|
| <b>Week 9</b>  | Pictures of human rights violations                                  |
| <b>Week 10</b> | Creating genocide graves for the Baath regime in Iraq                |
| <b>Week 11</b> | Chronological classification of genocide graves in Iraq              |
| <b>Week 12</b> | Graves of the victims of the Anfal massacre for the period 1987-1988 |
| <b>Week 13</b> | Graves of the victims of the Anfal massacre for the period 1987-1988 |
| <b>Week 14</b> | Graves of victims of the 1991 Shaabani uprising                      |
| <b>Week 15</b> | Graves of victims of the 1991 Shaabani uprising                      |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                        |

| <b>Learning and Teaching Resources</b><br><b>مصادر التعلم والتدريس</b> |                                                                                                                                                   |                                  |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                                                        | <b>Text</b>                                                                                                                                       | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                                  | Mechanics of Materials-Andrew Pytel                                                                                                               | No                               |
| <b>Recommended Texts</b>                                               | Strength of Materials-Ferdinand L.Singer                                                                                                          | No                               |
| <b>Websites</b>                                                        | <a href="https://www.coursera.org/courses?query=mechanics%20of%20materials">https://www.coursera.org/courses?query=mechanics%20of%20materials</a> |                                  |

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

| Module Information                 |                            |                 |                                                                                                                                                                                                                                          |                   |   |
|------------------------------------|----------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---|
| معلومات المادة الدراسية            |                            |                 |                                                                                                                                                                                                                                          |                   |   |
| Module Title                       | <b>Concrete technology</b> |                 | Module Delivery                                                                                                                                                                                                                          |                   |   |
| Module Type                        | Core                       |                 | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                   |   |
| Module Code                        | <b>CE216</b>               |                 |                                                                                                                                                                                                                                          |                   |   |
| ECTS Credits                       | 8                          |                 |                                                                                                                                                                                                                                          |                   |   |
| SWL (hr/sem)                       | <b>120</b>                 |                 |                                                                                                                                                                                                                                          |                   |   |
| Module Level                       |                            | 2               | Semester of Delivery                                                                                                                                                                                                                     |                   | 2 |
| Administering Department           |                            | Type Dept. Code | College                                                                                                                                                                                                                                  | Type College Code |   |
| Module Leader                      |                            |                 | e-mail                                                                                                                                                                                                                                   |                   |   |
| 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 |                            | 01/09/2025      | Version Number                                                                                                                                                                                                                           | 1.0               |   |

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

| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br><b>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br><b>أهداف المادة الدراسية</b>                                                                               | <p>This Module aims at helping students:</p> <ol style="list-style-type: none"> <li>1. To develop an understanding about the fundamentals of concrete technology.</li> <li>2. To be aware of concrete historical development, general characteristics, types, and factors influencing Concrete properties.</li> <li>3. To discuss and understand the materials involved in making Concrete.</li> <li>4. Studying the concrete at its Fresh Stage including its design, estimation of material proportions as well as manufacturing, delivery, placing and curing.</li> <li>5. Study the concrete at it Hardened stage including understanding concepts such as Shrinkage and Creep as well as Durability of concrete.</li> <li>6. To understand the various laboratory tests required to be done for the concrete at various stages of its development.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Module Learning Outcomes</b><br><b>مخرجات التعلم للمادة الدراسية</b>                                                          | <p>By the end of this module, students should be able to exhibit the following key learning outcomes of this module:</p> <ol style="list-style-type: none"> <li>1. Recall key historical stages of concrete development over the centuries. Discuss and list concrete types, characteristics and factors influencing its properties.</li> <li>2. Define and list the various types of cementitious binders. Explain the process of manufacturing Portland cement and its chemical composition.</li> <li>3. Explain the hydration process of Portland cement and define Portland cement types.</li> <li>4. Explain the effect of aggregate on concrete and classify the various types of aggregates. Discuss and explain the properties of aggregates.</li> <li>5. Calculate the various moisture conditions of aggregate moisture content, fineness modules and Bulk specific gravity. Discuss the characteristics of water used in concrete.</li> <li>6. Define the workability of fresh concrete and explain its method of measurement, segregation, bleeding and list the factors affecting workability of concrete.</li> <li>7. Explain and carry out the relevant calculations for concrete mix design using both the American and British methods.</li> <li>8. Discuss the manufacturing process of concrete and explain the key factors to be considered during the delivery and placing of concrete.</li> <li>9. Discuss the Hardened stage of Concrete including explaining key topics such as strengths of Hardened Concrete, Dimensional Stability—Shrinkage and Creep, Durability as well as non-destructive tests.</li> </ol> |
| <b>Indicative Contents</b><br><b>المحتويات الإرشادية</b>                                                                         | <p>Indicative content includes the following:</p> <ol style="list-style-type: none"> <li>1. Introduction to Concrete<br/>Concrete Definition and Historical Development, Concrete as a Structural Material, Characteristics of Concrete, Types of Concrete, Factors Influencing Concrete Properties.</li> <li>2. Materials for Making Concrete<br/>Cementitious Binders, Aggregates, Admixtures and Water</li> <li>3. Fresh Concrete</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|  |                                                                                                                                                                                                                                                                                                                                         |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Workability of Fresh Concrete, Mix Design, Procedures for Concrete Mix Design, Manufacture of Concrete, Delivery of Concrete, Concrete Placing, Early-Age Properties of Concrete.</p> <p>4. Hardened Concrete</p> <p>Strengths of Hardened Concrete, Dimensional Stability—Shrinkage and Creep, Durability, Nondestructive tests</p> |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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

| <b>Student Workload (SWL)</b><br><b>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا</b> |     |                                                                           |   |
|---------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|---|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراي المنتظم للطالب خلال الفصل         | 100 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب اسبوعيا       | 7 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل  | 75  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب اسبوعيا | 5 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل               | 175 |                                                                           |   |

| Module Evaluation     |                 |             |                  |            |                           |
|-----------------------|-----------------|-------------|------------------|------------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |            |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 15% (15)         | 4, 13      | LO # 2, 3, 4, 5 and 7     |
|                       | Assignments     | 2           | 8% (8)           | 3, 9       | LO # 1 and 6              |
|                       | Projects / Lab. | 1           | 10% (10)         | Continuous |                           |
|                       | Report          | 1           | 7% (7)           | 14         | LO # 7, 8 and 9           |
| Summative assessment  | Midterm Exam    | 2 hr        | 10% (10)         | 7          | LO # 1 to 5               |
|                       | Final Exam      | 2hr         | 50% (50)         | 16         | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |            |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                                                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| المناهج الاسبوعي النظري         |                                                                                                                                                                                                |
|                                 | Material Covered                                                                                                                                                                               |
| Week 1                          | Concrete Definition and Historical Development, Concrete as a Structural Material, Characteristics of Concrete, Types of Concrete and Factors Influencing Concrete Properties.                 |
| Week 2                          | Cementitious Binders: Classification of binders, Portland cement, Manufacture of Portland cement, Chemical composition, Hydration of Portland cement                                           |
| Week 3                          | Cementitious Binders: Types of Portland cement, The role of water, Basic tests of Portland cement, Geopolymers                                                                                 |
| Week 4                          | Aggregates: Effects of aggregates, Classification of aggregates, Properties of aggregates, Moisture conditions, Moisture content (MC) calculations, Density and specific gravity, Unit weight, |
| Week 5                          | Measurement of moisture content, Grading aggregates, Shape and texture of aggregates. Solved examples for Moisture content (MC) calculations.                                                  |
| Week 6                          | Admixtures: Definition and classifications, Chemical admixtures, Air-entraining admixtures, Mineral admixtures.<br>Water: Mixing water, Impurities in water, Water for curing and washing.     |
| Week 7                          | Midterm Exam<br>Workability of fresh concrete, Segregation and bleeding, slump loss.                                                                                                           |

|                |                                                                                                                                                                                                            |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 8</b>  | Introduction to Mix Design. Procedures For Concrete Mix Design using the American Institute of Concrete method                                                                                             |
| <b>Week 9</b>  | Solved Examples for American method for concrete Mix design.                                                                                                                                               |
| <b>Week 10</b> | Procedures For Concrete Mix Design using the British Standards Institute.                                                                                                                                  |
| <b>Week 11</b> | Solved Examples for British method for concrete Mix design.                                                                                                                                                |
| <b>Week 12</b> | Manufacture of Concrete. Delivery of Concrete.<br>Concrete Placing: Site preparation, conveying concrete, Depositing concrete in forms, Compacting and finishing, Curing. Early-Age Properties of Concrete |
| <b>Week 13</b> | Strengths of Hardened Concrete: Definitions, Compressive strength, and corresponding tests.                                                                                                                |
| <b>Week 14</b> | Uniaxial tensile strength and corresponding tests, Flexural strength and corresponding tests, Bond strength.                                                                                               |
| <b>Week 15</b> | Shrinkage and Creep, Durability. Non-destructive tests                                                                                                                                                     |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                                                                                                                              |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                                                                                         |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
|                                                                         | <b>Material Covered</b>                                                                                 |
| <b>Week 1</b>                                                           | Lab 1: Fineness of Cement measurement: Method 1 & 2: Blaine Air Permeability & Sieve Analysis.          |
| <b>Week 2</b>                                                           | Lab 2: Determination of Standard Consistency of Cement.                                                 |
| <b>Week 3</b>                                                           | Lab 3: Initial and Final Setting Time of Cement.                                                        |
| <b>Week 4</b>                                                           | Lab 4: Portland Cement Compressive and Tensile Strength: Casting stage.                                 |
| <b>Week 5</b>                                                           | Lab 5: Portland Cement Compressive and Tensile Strength: Testing Stage.                                 |
| <b>Week 6</b>                                                           | Lab 6: Standard Test Method for Relative Density (Specific Gravity) and Absorption of Fine Aggregate.   |
| <b>Week 7</b>                                                           | Lab 7: Standard Test Method for Relative Density (Specific Gravity) and Absorption of Coarse Aggregate. |
| <b>Week 8</b>                                                           | Lab 8: Sieve Analysis of Fine and Coarse Aggregate Test.                                                |
| <b>Week 9</b>                                                           | Lab 9: Slump Test for Concrete.                                                                         |

|                   |                                                                               |
|-------------------|-------------------------------------------------------------------------------|
| <b>Week 10</b>    | Lab 10: Compaction Factor Test for Concrete                                   |
| <b>Week 11</b>    | Lab 11: Compressive and Tensile Strength Test for Concrete                    |
| <b>Week 12-14</b> | For Students to Carry out the relevant tests to complete their Module report. |
| <b>Week 15</b>    | Practical Exam                                                                |

| <b>Learning and Teaching Resources</b><br><b>مصادر التعلم والتدريس</b> |                                                                                                              |                                  |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                                                        | <b>Text</b>                                                                                                  | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                                  | Zongjin Li. Advanced Concrete Technology. Advanced Concrete Technology, Published by John Wiley & Sons, Inc. | No                               |
| <b>Recommended Texts</b>                                               |                                                                                                              | No                               |
| <b>Websites</b>                                                        |                                                                                                              |                                  |

| <b>Grading Scheme</b><br><b>مخطط الدرجات</b>                                                                                                                                                                                                                                                                                                                                         |                         |                    |                  |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------|------------------|---------------------------------------|
| <b>Group</b>                                                                                                                                                                                                                                                                                                                                                                         | <b>Grade</b>            | <b>التقدير</b>     | <b>Marks (%)</b> | <b>Definition</b>                     |
| <b>Success Group (50 - 100)</b>                                                                                                                                                                                                                                                                                                                                                      | <b>A - Excellent</b>    | امتياز             | 90 - 100         | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>B - Very Good</b>    | جدا جدا            | 80 - 89          | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>C - Good</b>         | جدا                | 70 - 79          | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>D - Satisfactory</b> | متوسط              | 60 - 69          | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>E - Sufficient</b>   | مقبول              | 50 - 59          | Work meets minimum criteria           |
| <b>Fail Group (0 – 49)</b>                                                                                                                                                                                                                                                                                                                                                           | <b>FX – Fail</b>        | راسب (قد المعالجة) | (45-49)          | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>F – Fail</b>         | راسب               | (0-44)           | Considerable amount of work required  |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                         |                    |                  |                                       |

| <b>Module Information</b><br><b>معلومات المادة الدراسية</b> |
|-------------------------------------------------------------|
|-------------------------------------------------------------|

|                                    |                               |                               |                                                                                                                                                                                                                               |  |
|------------------------------------|-------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Module Title                       | <b>Strength of Material I</b> |                               | Module Delivery                                                                                                                                                                                                               |  |
| Module Type                        | Core                          |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Code                        | CE213                         |                               |                                                                                                                                                                                                                               |  |
| ECTS Credits                       | 5                             |                               |                                                                                                                                                                                                                               |  |
| SWL (hr/sem)                       | 75                            |                               |                                                                                                                                                                                                                               |  |
| Module Level                       | 2                             | Semester of Delivery          | 1,2                                                                                                                                                                                                                           |  |
| Administering Department           | Type Dept. Code               | College                       | Type College Code                                                                                                                                                                                                             |  |
| Module Leader                      |                               | e-mail                        |                                                                                                                                                                                                                               |  |
| 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 | 01/09/2025                    | Version Number                | 1.0                                                                                                                                                                                                                           |  |

| Relation with other Modules       |                                |          |  |
|-----------------------------------|--------------------------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                                |          |  |
| Prerequisite module               | Engineering Mechanics (Static) | Semester |  |
| Co-requisites module              | None                           | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents           |                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية         |                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | The objective of this course is elaborate on the knowledge of engineering mechanics (statics) and to teach the students the purpose of studying strength of materials with respect to civil engineering design and analysis. The course introduces the students to the concepts of engineering mechanics of materials and the behavior of the materials and structures under applied loads |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | Apply the knowledge of fundamental sciences mainly mathematics and physics to identify, formulate and solve civil engineering problems including stress, strain and deflection calculations as well as calculating axial force, shear and bending moment diagrams used in civil engineering analysis and design                                                                            |

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Indicative Contents</b><br>المحتويات الإرشادية | The objectives of CE213, Strength of Materials, are to learn the principles of mechanics applied to different materials [III] and to develop problem solving skills through application of these principles to basic engineering problems. Specific topics covered in this class include: behavior of axially loaded members; torsion of circular shafts; stresses and deflections in beams; connectors in built-up beams; stress transformation under rotation of axes; principal stresses; triaxial stress and maximum shear stress; pressure vessels; and buckling behavior of columns. The course will rely on students' prerequisite knowledge of mathematics and basic science [II] in developing principles and analytical techniques of mechanics of materials. |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | This module will be delivered with a strategy that encourage students' to participate in the discussion, exercises solving, and 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 projects involving some sampling activities that are interesting to the students. |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |      |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|------|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 128 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب اسبوعيا       | 9    |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 97  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب اسبوعيا | 6.46 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 225 |                                                                           |      |

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

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

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                                            |
|-------------------------------------------------------------------|------------------------------------------------------------|
|                                                                   | <b>Material Covered</b>                                    |
| <b>Week 1</b>                                                     | Introduction and review of statics – equilibrium.          |
| <b>Week 2</b>                                                     | Simple stresses and strains                                |
| <b>Week 3</b>                                                     | Mechanical properties of materials                         |
| <b>Week 4</b>                                                     | Axial load and deformation on axial load                   |
| <b>Week 5</b>                                                     | Thermal stresses and strains                               |
| <b>Week 6</b>                                                     | Thin walled cylinder                                       |
| <b>Week 7</b>                                                     | Torsion-calculation of simple torsion for circular shafts. |
| <b>Week 8</b>                                                     | Plan Stress Analysis (Two Dimensional Stress Analysis)     |
| <b>Week 9</b>                                                     | Shearing Forces and Bending Moments in Beams               |
| <b>Week 10</b>                                                    | Shear force and bending moment diagrams.                   |
| <b>Week 11</b>                                                    | Bending stress in Beams                                    |
| <b>Week 12</b>                                                    | Shearing stress in beams                                   |
| <b>Week 13</b>                                                    | Deflection of Beams-Integration Method                     |
| <b>Week 14</b>                                                    | Deflection of Beams-Singularity Method                     |
| <b>Week 15</b>                                                    | Buckling of Columns.                                       |
| <b>Week 16</b>                                                    | <b>Preparatory week before the final Exam</b>              |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس |                                                                                                                                                   |                           |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                          | Text                                                                                                                                              | Available in the Library? |
| Required Texts                                           | Mechanics of Materials-Andrew Pytel                                                                                                               | No                        |
| Recommended Texts                                        | Strength of Materials-Ferdinand L.Singer                                                                                                          | No                        |
| Websites                                                 | <a href="https://www.coursera.org/courses?query=mechanics%20of%20materials">https://www.coursera.org/courses?query=mechanics%20of%20materials</a> |                           |

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

| Module Information                 |                                |                 |                                                                                                                                                                                                                                          |                   |       |
|------------------------------------|--------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|
| معلومات المادة الدراسية            |                                |                 |                                                                                                                                                                                                                                          |                   |       |
| Module Title                       | <b>Strength of Material II</b> |                 | Module Delivery                                                                                                                                                                                                                          |                   |       |
| Module Type                        | Core                           |                 | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input checked="" type="checkbox"/> Seminar |                   |       |
| Module Code                        | <b>CE213</b>                   |                 |                                                                                                                                                                                                                                          |                   |       |
| ECTS Credits                       | 5                              |                 |                                                                                                                                                                                                                                          |                   |       |
| SWL (hr/sem)                       | <b>75</b>                      |                 |                                                                                                                                                                                                                                          |                   |       |
| Module Level                       |                                | 2               | Semester of Delivery                                                                                                                                                                                                                     |                   | 1,2   |
| Administering Department           |                                | Type Dept. Code | College                                                                                                                                                                                                                                  | Type College Code |       |
| Module Leader                      | Jasim Mohsin                   |                 | e-mail                                                                                                                                                                                                                                   |                   |       |
| Module Leader's Acad. Title        |                                | Lecturer        | Module Leader's Qualification                                                                                                                                                                                                            |                   | PH.D. |
| Module Tutor                       | Name (if available)            |                 | e-mail                                                                                                                                                                                                                                   | E-mail            |       |
| Peer Reviewer Name                 |                                | Name            | e-mail                                                                                                                                                                                                                                   | E-mail            |       |
| Scientific Committee Approval Date |                                | 01/09/2025      | Version Number                                                                                                                                                                                                                           | 1.0               |       |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                            |
| Module Aims<br>أهداف المادة الدراسية                     | The objective of this course is elaborate on the knowledge of engineering mechanics (statics) and to teach the students the purpose of studying strength of materials with respect to civil engineering design and analysis. The course introduces the students to the concepts of engineering mechanics of materials and the behavior of the materials and structures under applied loads |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | Apply the knowledge of fundamental sciences mainly mathematics and physics to identify, formulate and solve civil engineering problems including stress, strain and deflection calculations as well as calculating axial force, shear and bending moment diagrams used in civil engineering analysis and design                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | The objectives of CE213, Strength of Materials, are to learn the principles of mechanics applied to different materials [III] and to develop problem solving skills through application of these principles to basic engineering problems. Specific topics covered in this class include: behavior of axially loaded members; torsion of circular shafts; stresses and deflections in beams; connectors in built-up beams; stress transformation under rotation of axes; principal stresses; triaxial stress and maximum shear stress; pressure vessels; and buckling behavior of columns. The course will rely on students' prerequisite knowledge of mathematics and basic science [II] in developing principles and analytical techniques of mechanics of materials. |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | This module will be delivered with a strategy that encourage students' to participate in the discussion, exercises solving, and 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 projects involving some sampling activities that are interesting to the students. |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا |     |                                                                     |   |
|--------------------------------------------------------------------------|-----|---------------------------------------------------------------------|---|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل | 128 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب اسبوعيا | 9 |

|                                                                                |     |                                                                           |      |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|------|
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 97  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب اسبوعيا | 6.46 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 225 |                                                                           |      |

| 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 |                           |
|                       | 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                          | Shear forces and bending moments in the beams |
| Week 2                          | Shear forces and bending moments in the beam  |
| Week 3                          | Shear forces and bending moments in the beam  |
| Week 4                          | Graphs of shear forces and bending moments.   |
| Week 5                          | Graphs of shear forces and bending moments.   |
| Week 6                          | Graphs of shear forces and bending moments.   |
| Week 7                          | Bending stress in beams                       |
| Week 8                          | Bending stress in beams                       |
| Week 9                          | Bending stress in beams                       |
| Week 10                         | Bending stress in beams                       |
| Week 11                         | The deviation of bundles - Integration method |
| Week 12                         | The deviation of bundles - Integration method |
| Week 13                         | Beam deviation - The uniqueness method        |
| Week 14                         | Buckling of Columns.                          |
| Week 15                         | Buckling of Columns.                          |
| Week 16                         | Preparatory week before the final Exam        |

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

| Learning and Teaching Resources |                                                                                                                                                   |                           |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| مصادر التعلم والتدريس           |                                                                                                                                                   |                           |
|                                 | Text                                                                                                                                              | Available in the Library? |
| Required Texts                  | Mechanics of Materials-Andrew Pytel                                                                                                               | No                        |
| Recommended Texts               | Strength of Materials-Ferdinand L.Singer                                                                                                          | No                        |
| Websites                        | <a href="https://www.coursera.org/courses?query=mechanics%20of%20materials">https://www.coursera.org/courses?query=mechanics%20of%20materials</a> |                           |

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

| Module Information                 |                               |                               |                                                                                                                                                                                                                                          |  |
|------------------------------------|-------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية            |                               |                               |                                                                                                                                                                                                                                          |  |
| Module Title                       | <b>Engineering Statistics</b> |                               | Module Delivery                                                                                                                                                                                                                          |  |
| Module Type                        | Supportive                    |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Code                        | <b>CE227</b>                  |                               |                                                                                                                                                                                                                                          |  |
| ECTS Credits                       | 4                             |                               |                                                                                                                                                                                                                                          |  |
| SWL (hr/sem)                       | <b>45</b>                     |                               |                                                                                                                                                                                                                                          |  |
| Module Level                       | 2                             | Semester of Delivery          | 2                                                                                                                                                                                                                                        |  |
| Administering Department           | Type Dept. Code               | College                       | Type College Code                                                                                                                                                                                                                        |  |
| Module Leader                      |                               | e-mail                        |                                                                                                                                                                                                                                          |  |
| 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 | 01/09/2025                    | Version Number                | 1.0                                                                                                                                                                                                                                      |  |

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

| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                                                                               | The module aims to present the basic of engineering statistics by analyzing, organizing and describing data in tables and drawings, knowing the measures of dispersion and central tendency, in addition to knowing the theory of probability and inference from the data to make decisions and linking them to engineering reality.                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية                                                          | A- Knowledge and Understanding<br>1- Understand the importance of statistics and its divisions.<br>2- Learn how to show and represent statistical data with tables or graphics.<br>3- Identify the most important measures of central tendency and dispersion of data.<br>4- Learn about probability theory and its different distributions.<br>5- Identifying the design of samples, their estimation, and knowledge of their properties.<br>B. Subject-specific skills<br>1- Analyze, organize, and describe data in tables and/or curves.<br>2- Describe the averages of the data and methods of measuring their dispersion.<br>3- Engineering inference from the statistical data to take the appropriate decision.<br>4- Linking information to engineering reality. |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                  |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | Weekly homework and daily and weekly quizzes. Giving assignments and activities in the classroom. As well as guiding students to the important scientific sources and taking some exercises to practice on them. |

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 58  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 42  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 2.8 |
| <b>Total SWL (h/sem)</b><br>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)         |          |                           |
|                       | Assignments     | 2           | 10% (10)         |          |                           |
|                       | Projects / Lab. | 1           | 10% (10)         |          |                           |
|                       | Report          | 1           | 10% (10)         |          |                           |
| Summative assessment  | Midterm Exam    | 2 hr        | 10% (10)         |          |                           |
|                       | 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 ENGINEERING STATISTICS (Brief definition in statistics)                               |
| Week 2                          | PRESENTATION OF STATISTICS DATA cont. (Frequency distributions, Frequency distributions table)        |
| Week 3                          | PRESENTATION OF STATISTICS DATA (Cumulative frequency distribution, Graphical representation of data) |

|                |                                                                                                                         |
|----------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Week 4</b>  | Graphical representation of data (Cumulative frequency curves, Histogram, Frequency polygon)                            |
| <b>Week 5</b>  | MEASURES OF CENTRAL LOCATION (Measures of center, four types)                                                           |
| <b>Week 6</b>  | MEASURES OF DISPERSION, THE PROBABILITY (Measures of dispersion, four types, Probability theory)                        |
| <b>Week 7</b>  | THE PROBABILITY cont. (Combinations of Three or More Events)                                                            |
| <b>Week 8</b>  | THE PROBABILITY cont. (Probability theory rules, Conditional Probability, Bayes' theorems)                              |
| <b>Week 9</b>  | Geometric Probability (Geometric Probability examples)                                                                  |
| <b>Week 10</b> | PROBABILITY DISTRIBUTION (Discrete probability distribution, Discrete Uniform Distribution)                             |
| <b>Week 11</b> | PROBABILITY DISTRIBUTION, cont. (Geometric Distribution, Negative binomial Distribution, Binomial Distribution)         |
| <b>Week 12</b> | Continuous Probability Distributions, Continuous Uniform Distributions, Normal Distributions, Exponential Distribution) |
| <b>Week 13</b> | SAMPLING DISTRIBUTION (Sampling Distribution of the Sample Mean, Central Limit Theorem, applications)                   |
| <b>Week 14</b> | THE EXPECTATION (Expectation properties and Moments)                                                                    |
| <b>Week 15</b> | THE ESTIMATION (point estimator, interval estimator)                                                                    |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                                           |

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

|        |  |
|--------|--|
| Week 4 |  |
| Week 5 |  |
| Week 6 |  |
| Week 7 |  |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس |                                                                 |                           |
|----------------------------------------------------------|-----------------------------------------------------------------|---------------------------|
|                                                          | Text                                                            | Available in the Library? |
| Required Texts                                           | Statistics with engineering applications<br>Entry to statistics | --                        |
| Recommended Texts                                        | Fundamentals of Behavioral Statistics ,1988                     | --                        |
| Websites                                                 |                                                                 |                           |

| Grading Scheme<br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                       |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                          | A - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | B - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | C - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | D - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | E - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                               | FX – Fail        | راسب (قيد المعالجة) | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | F – Fail         | راسب                | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                  |                     |           |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                  |                     |           |                                       |

نماذج وصف المواد الدراسية-المرحلة الثالثة-قسم الهندسة المدنية

| Module Information                 |                               |                               |                                                                                                                                                                                                                    |
|------------------------------------|-------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                               |                               |                                                                                                                                                                                                                    |
| Module Title                       | <b>Irrigation Engineering</b> |                               | Module Delivery                                                                                                                                                                                                    |
| Module Type                        | Core                          |                               | <input type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>CE315</b>                  |                               |                                                                                                                                                                                                                    |
| ECTS Credits                       | 8                             |                               |                                                                                                                                                                                                                    |
| SWL (hr/sem)                       | <b>200</b>                    |                               |                                                                                                                                                                                                                    |
| Module Level                       | 4                             | Semester of Delivery          | 2                                                                                                                                                                                                                  |
| Administering Department           | Type Dept. Code               | College                       | Type College Code                                                                                                                                                                                                  |
| Module Leader                      |                               | e-mail                        |                                                                                                                                                                                                                    |
| Module Leader's Acad. Title        |                               | Module Leader's Qualification |                                                                                                                                                                                                                    |
| Module Tutor                       |                               | e-mail                        |                                                                                                                                                                                                                    |
| Peer Reviewer Name                 | Name                          | e-mail                        | E-mail                                                                                                                                                                                                             |
| Scientific Committee Approval Date | 1/09/2025                     | Version Number                | 1.0                                                                                                                                                                                                                |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | <ol style="list-style-type: none"> <li>This course covers the basic concepts of irrigation engineering and explains the different irrigation methods.</li> <li>Demonstrate the relationship between irrigation engineering (within agricultural engineering) and civil engineering.</li> <li>Develop skills in understanding and solving problems within the field of agricultural engineering, such as water waste problems.</li> <li>Present the principles and laws taken in other related courses and demonstrate their importance and how to apply and employ them in irrigation</li> </ol> |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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|                                                                      | engineering to solve potential engineering problems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | <ol style="list-style-type: none"> <li>1. Clarifying the basic concepts of irrigation engineering systems and their applications in agricultural fields</li> <li>2. Acquiring basic skills in managing irrigation systems optimally.</li> <li>3. Gaining the appropriate experience in designing irrigation systems in different ways and their suitability to different surrounding conditions and knowing the difference between the old and modern irrigation systems.</li> <li>4. Developing the ability to solve water waste problems and finding the best ways to reduce them.</li> <li>5. Developing the ability to write scientific reports and reading charts with tables.</li> </ol> <p>This course covers a wide range of different irrigation methods, their optimal conditions and design methods with the aim of enriching the knowledge base of the civil engineer in the field of agricultural engineering in a way that enables him to solve potential engineering problems in this field effectively.</p> |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | <ul style="list-style-type: none"> <li>• The main strategy for delivering this module is to encourage student's participation in the exercises while refining and expanding their critical thinking skills. This will be achieved through theoretical lectures, small discussion groups, presentation of scientific films, writing reports, and using the scientific web sites.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|  |                                                                                                                                                                                                                    |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Direct questions in a manner (how and why) for the subject during the lecture.</li> <li>• short exams during the theoretical lecture.</li> <li>• Midterm exam.</li> </ul> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <ul style="list-style-type: none"> <li>• The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>• The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>• The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>designed to bring together different concepts from individual examples and homework problems and combine them. My intent in developing exam questions is not to evaluate whether a student can solve a given problem, but to determine whether they understand and can apply the concepts required to solve this problem. After all, the chance that they will face the exact problem in practice is negligible, but the interaction of concepts to solve new problem is vital. As a result, students work is graded with respect to the process used in solving the problem rather than the final answer they will get.</p> <p>A professor should be sensitive to the background and preparation of the students. The way the students are treated has a great influence on the student's performance. I strive to demonstrate to each student my respect for them as individuals and for their contributions to the learning process. Thus, I try to learn every student's name and maintain a high level of classroom interaction. The class atmosphere is very relaxed, so students feel comfortable contributing and asking questions. To further facilitate students learning, I like to provide opportunities for reflection and feedback from students via after-class and office discussions, peer-to-peer feedback on assignments and learning activities and formal and informal evaluations. Students' responses and inputs are very helpful for improving my teaching skills.</p> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 140 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 60  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 200 |                                                                           |     |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                |             |                |               |                           |
|---------------------------------------------------|----------------|-------------|----------------|---------------|---------------------------|
|                                                   |                | Time/Number | Weight (Marks) | Week Due      | Relevant Learning Outcome |
| Formative assessment                              | Quizzes        | 2           | 10% (10)       | 3 , 7         | All                       |
|                                                   | Assignments    | 2           | 10% (10)       | 2,4,6,8,10,12 | All                       |
|                                                   | Class activity | 1           | 10% (10)       |               |                           |
|                                                   | Report         | 1           | 10% (10)       |               |                           |
| Summative assessment                              | Midterm Exam   | 1 hr        | 10% (10)       | 10            | 1-5                       |
|                                                   | Final Exam     | 2hr         | 50% (50)       | 16            | All                       |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

|         | Material Covered                           |
|---------|--------------------------------------------|
| Week 1  | Introduction to the Irrigation Engineering |
| Week 2  | Introduction to the Irrigation Engineering |
| Week 3  | Introduction to the Irrigation Engineering |
| Week 4  | Introduction to the Irrigation Engineering |
| Week 5  | Land gradation design                      |
| Week 6  | Surface irrigation                         |
| Week 7  | Strip irrigation                           |
| Week 8  | Furrow irrigation                          |
| Week 9  | design of beam-columns in braced frames    |
| Week 10 | Sprinkler irrigation                       |
| Week 11 | Sprinkler irrigation                       |
| Week 12 | Sprinkler irrigation                       |
| Week 13 | Sprinkler irrigation                       |
| Week 14 | Trickle irrigation                         |
| Week 15 | Trickle irrigation                         |
| Week 16 | Preparatory week before the final Exam     |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                | Text                                                                                                                                                                                                                                             | Available in the Library? |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Required Texts | 1. اساسيات الري تأليف جورج هار غريفز وغاري ميركلي<br>2. مقدمة في نظم الري للدكتور سمير محمد إسماعيل<br>3. Irrigation and Drainage Engineering by Peter Waller and Muluneh Yitayew<br>4. Irrigation and water resources engineering by G.L. Asawa | Yes                       |

## Grading Scheme

### مخطط الدرجات

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

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

| Module Information                 |                  |                      |                                                                                                                                                                                                                                          |  |
|------------------------------------|------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية            |                  |                      |                                                                                                                                                                                                                                          |  |
| Module Title                       | Soil Mechanics 1 |                      | Module Delivery                                                                                                                                                                                                                          |  |
| Module Type                        | Core             |                      | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Code                        | CE313            |                      |                                                                                                                                                                                                                                          |  |
| ECTS Credits                       | 8                |                      |                                                                                                                                                                                                                                          |  |
| SWL (hr/sem)                       | 200              |                      |                                                                                                                                                                                                                                          |  |
| Module Level                       | 4                | Semester of Delivery | 2                                                                                                                                                                                                                                        |  |
| Administering Department           | Type Dept. Code  | College              | Type College Code                                                                                                                                                                                                                        |  |
| Module Leader                      |                  |                      | e-mail                                                                                                                                                                                                                                   |  |
| Module Leader's Acad. Title        |                  |                      | Module Leader's Qualification                                                                                                                                                                                                            |  |
| Module Tutor                       |                  |                      | e-mail                                                                                                                                                                                                                                   |  |
| Peer Reviewer Name                 | Name             | e-mail               | E-mail                                                                                                                                                                                                                                   |  |
| Scientific Committee Approval Date | 1/09/2025        | Version Number       | 1.0                                                                                                                                                                                                                                      |  |

| Relation with other Modules       |                  |          |  |
|-----------------------------------|------------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                  |          |  |
| Prerequisite module               | Soil Mechanics 1 | Semester |  |
| Co-requisites module              | None             | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                           |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                           |
| Module Aims<br>أهداف المادة الدراسية                     | Theoretical lectures, practical lectures, small discussion groups, presentation of scientific films, and writing reports. |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | C. Thinking Skills<br>C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.<br>C2- Response: Follow up the student's interaction with the material displayed on the screen.<br>C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.<br>C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.<br>C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | <ul style="list-style-type: none"> <li>The main strategy for delivering this module is to encourage student's participation in the exercises while refining and expanding their critical thinking skills. This will be achieved through theoretical lectures, small discussion groups, presentation of scientific films, writing reports, and using the scientific web sites.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|  |                                                                                                                                                                                                              |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>Direct questions in a manner (how and why) for the subject during the lecture.</li> <li>short exams during the theoretical lecture.</li> <li>Midterm exam.</li> </ul> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <ul style="list-style-type: none"> <li>The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.</li> <li>• Sudden exams during the theoretical and practical lecture.</li> <li>• Quarterly exams for the theoretical and practical side.</li> <li>• Final exams for the theoretical and practical side.</li> </ul> <p>D. General and Transferable Skills (other skills relevant to employability and personal development)</p> <p>D1- Develop the student's ability to perform the duties and deliver them on time</p> <p>D2 - Logical and programmatic thinking to find programmatic solutions to various problems</p> <p>D3 - developing the student's ability to dialogue and debate</p> <p>D4 - Develop the student's ability to deal with modern technology, especially the Internet</p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 140 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 60  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 200 |                                                                           |     |

| Module Evaluation           |                       |             |                  |               |                           |
|-----------------------------|-----------------------|-------------|------------------|---------------|---------------------------|
| تقييم المادة الدراسية       |                       |             |                  |               |                           |
|                             |                       | Time/Number | Weight (Marks)   | Week Due      | Relevant Learning Outcome |
| <b>Formative assessment</b> | <b>Quizzes</b>        | 2           | 10% (10)         | 3 , 7         | All                       |
|                             | <b>Assignments</b>    | 2           | 10% (10)         | 2,4,6,8,10,12 | All                       |
|                             | <b>Class activity</b> | 1           | 10% (10)         |               |                           |
|                             | <b>Report</b>         | 1           | 10% (10)         |               |                           |
| <b>Summative assessment</b> | <b>Midterm Exam</b>   | 1 hr        | 10% (10)         | 10            | 1-5                       |
|                             | <b>Final Exam</b>     | 2hr         | 50% (50)         | 16            | All                       |
| <b>Total assessment</b>     |                       |             | 100% (100 Marks) |               |                           |

| Delivery Plan (Weekly Syllabus) |                                |
|---------------------------------|--------------------------------|
| المنهاج الاسبوعي النظري         |                                |
|                                 | Material Covered               |
| <b>Week 1</b>                   | Basic Characteristics of Soils |

|                |                                               |
|----------------|-----------------------------------------------|
| <b>Week 2</b>  | Weight-Volume Relationships                   |
| <b>Week 3</b>  | Weight-Volume Relationships                   |
| <b>Week 4</b>  | Plasticity and Structure of Soil              |
| <b>Week 5</b>  | Plasticity and Structure of Soil              |
| <b>Week 6</b>  | Classification of Soil                        |
| <b>Week 7</b>  | Classification of Soil                        |
| <b>Week 8</b>  | Soil Compaction                               |
| Week 9         | Soil Compaction                               |
| Week 10        | Permeability                                  |
| <b>Week 11</b> | Permeability                                  |
| <b>Week 12</b> | Seepage                                       |
| <b>Week 13</b> | Seepage                                       |
| <b>Week 14</b> | Seepage                                       |
| <b>Week 15</b> | Permeability                                  |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b> |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                                                         |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------|
|                                                                         | <b>Material Covered</b>                                                 |
| <b>Week 1</b>                                                           | • Determination of Natural Moisture Content                             |
| <b>Week 2</b>                                                           | • Specific Gravity of Soil Solids                                       |
| <b>Week 3</b>                                                           | • Sieve Analysis (Grain Size Distribution)                              |
| <b>Week 4</b>                                                           | • Hydrometer Analysis                                                   |
| <b>Week 5</b>                                                           | • Liquid Limit Determination (Casagrande and Cone Penetrometer Methods) |
| <b>Week 6</b>                                                           | • Plastic Limit and Plasticity Index Determination                      |
| <b>Week 7</b>                                                           | • Shrinkage Limit Test                                                  |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                 | Available in the Library? |
|--------------------------|----------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | - Principles of Geotechnical Engineering (By: Braja M. Das, 7th Ed.) | Yes                       |
| <b>Recommended Texts</b> | - Principles of Geotechnical Engineering (By: Braja M. Das, 7th Ed.) | No                        |
| <b>Websites</b>          |                                                                      |                           |

## Grading Scheme

مخطط الدرجات

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

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

| Module Information                 |                  |                      |                                                                                                                                                                                                                                          |   |
|------------------------------------|------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| معلومات المادة الدراسية            |                  |                      |                                                                                                                                                                                                                                          |   |
| Module Title                       | Soil Mechanics 2 |                      | Module Delivery                                                                                                                                                                                                                          |   |
| Module Type                        | Core             |                      | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |   |
| Module Code                        | CE313            |                      |                                                                                                                                                                                                                                          |   |
| ECTS Credits                       | 8                |                      |                                                                                                                                                                                                                                          |   |
| SWL (hr/sem)                       | 200              |                      |                                                                                                                                                                                                                                          |   |
| Module Level                       | 4                | Semester of Delivery |                                                                                                                                                                                                                                          | 2 |
| Administering Department           | Type Dept. Code  | College              | Type College Code                                                                                                                                                                                                                        |   |
| Module Leader                      |                  |                      | e-mail                                                                                                                                                                                                                                   |   |
| Module Leader's Acad. Title        |                  |                      | Module Leader's Qualification                                                                                                                                                                                                            |   |
| Module Tutor                       |                  |                      | e-mail                                                                                                                                                                                                                                   |   |
| Peer Reviewer Name                 | Name             | e-mail               | E-mail                                                                                                                                                                                                                                   |   |
| Scientific Committee Approval Date | 1/09/2025        | Version Number       | 1.0                                                                                                                                                                                                                                      |   |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                           |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                           |
| Module Aims<br>أهداف المادة الدراسية                     | Theoretical lectures, practical lectures, small discussion groups, presentation of scientific films, and writing reports. |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | C. Thinking Skills<br>C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.<br>C2- Response: Follow up the student's interaction with the material displayed on the screen.<br>C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display.<br>C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.<br>C 5- Formation of value behavior: meaning that the student reaches the top of the emotional ladder, so that he has a stable level in the lesson and does not become lazy or fidgety. |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | <ul style="list-style-type: none"> <li>The main strategy for delivering this module is to encourage student's participation in the exercises while refining and expanding their critical thinking skills. This will be achieved through theoretical lectures, small discussion groups, presentation of scientific films, writing reports, and using the scientific web sites.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|  |                                                                                                                                                                                                              |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>Direct questions in a manner (how and why) for the subject during the lecture.</li> <li>short exams during the theoretical lecture.</li> <li>Midterm exam.</li> </ul> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <ul style="list-style-type: none"> <li>The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.</li> <li>• Sudden exams during the theoretical and practical lecture.</li> <li>• Quarterly exams for the theoretical and practical side.</li> <li>• Final exams for the theoretical and practical side.</li> </ul> <p>D. General and Transferable Skills (other skills relevant to employability and personal development)</p> <p>D1- Develop the student's ability to perform the duties and deliver them on time</p> <p>D2 - Logical and programmatic thinking to find programmatic solutions to various problems</p> <p>D3 - developing the student's ability to dialogue and debate</p> <p>D4 - Develop the student's ability to deal with modern technology, especially the Internet</p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 140 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 60  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 200 |                                                                           |     |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                |             |                  |               |                           |
|---------------------------------------------------|----------------|-------------|------------------|---------------|---------------------------|
|                                                   |                | Time/Number | Weight (Marks)   | Week Due      | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | Quizzes        | 2           | 10% (10)         | 3 , 7         | All                       |
|                                                   | Assignments    | 2           | 10% (10)         | 2,4,6,8,10,12 | All                       |
|                                                   | Class activity | 1           | 10% (10)         |               |                           |
|                                                   | Report         | 1           | 10% (10)         |               |                           |
| <b>Summative assessment</b>                       | Midterm Exam   | 1 hr        | 10% (10)         | 10            | 1-5                       |
|                                                   | Final Exam     | 2hr         | 50% (50)         | 16            | All                       |
| <b>Total assessment</b>                           |                |             | 100% (100 Marks) |               |                           |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                         |
|-------------------------------------------------------------------|-------------------------|
|                                                                   | <b>Material Covered</b> |

|                |                                                         |
|----------------|---------------------------------------------------------|
| <b>Week 1</b>  | <b>In Situ Stresses</b>                                 |
| <b>Week 2</b>  | <b>Compressibility of Soil-Consolidation Settlement</b> |
| <b>Week 3</b>  | <b>Soil-Consolidation Settlement</b>                    |
| <b>Week 4</b>  | <b>Soil-Consolidation Settlement</b>                    |
| <b>Week 5</b>  | <b>Soil-Consolidation Settlement</b>                    |
| <b>Week 6</b>  | <b>Soil-Consolidation Settlement</b>                    |
| <b>Week 7</b>  | <b>Soil-Consolidation Settlement</b>                    |
| <b>Week 8</b>  | <b>Shear Strength of Soil</b>                           |
| <b>Week 9</b>  | <b>Shear Strength of Soil</b>                           |
| <b>Week 10</b> | <b>Shear Strength of Soil</b>                           |
| <b>Week 11</b> | <b>Shear Strength of Soil</b>                           |
| <b>Week 12</b> | <b>Shear Strength of Soil</b>                           |
| <b>Week 13</b> | <b>Lateral Earth Pressure</b>                           |
| <b>Week 14</b> | <b>Lateral Earth Pressure</b>                           |
| <b>Week 15</b> | <b>Lateral Earth Pressure</b>                           |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>           |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                                                                              |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
|                                                                         | <b>Material Covered</b>                                                                      |
| <b>Week 1</b>                                                           | • Consolidation Test (Odometer Test)                                                         |
| <b>Week 2</b>                                                           | • Direct Shear Test on Cohesionless Soils                                                    |
| <b>Week 3</b>                                                           | • Unconfined Compression Test (UCC) on Cohesive Soils                                        |
| <b>Week 4</b>                                                           | • Unconsolidated-Undrained (UU) Triaxial Compression Test                                    |
| <b>Week 5</b>                                                           | • Consolidated-Undrained (CU) Triaxial Compression Test with Pore Water Pressure Measurement |
| <b>Week 6</b>                                                           | • Consolidated-Drained (CD) Triaxial Compression Test                                        |
| <b>Week 7</b>                                                           | • Vane Shear Test (Laboratory and Field Simulation)                                          |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                 | Available in the Library? |
|--------------------------|----------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | - Principles of Geotechnical Engineering (By: Braja M. Das, 7th Ed.) | Yes                       |
| <b>Recommended Texts</b> | - Principles of Geotechnical Engineering (By: Braja M. Das, 7th Ed.) | No                        |
| <b>Websites</b>          |                                                                      |                           |

## Grading Scheme

مخطط الدرجات

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

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

| Module Information                 |                                               |                               |                                                                                                                                                                                                                                          |
|------------------------------------|-----------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                                               |                               |                                                                                                                                                                                                                                          |
| Module Title                       | <b>Traffic and Transportation Engineering</b> |                               | Module Delivery                                                                                                                                                                                                                          |
| Module Type                        | Core                                          |                               | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | CE317                                         |                               |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 8                                             |                               |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 200                                           |                               |                                                                                                                                                                                                                                          |
| Module Level                       | 4                                             | Semester of Delivery          | 2                                                                                                                                                                                                                                        |
| Administering Department           | Type Dept. Code                               | College                       | Type College Code                                                                                                                                                                                                                        |
| Module Leader                      |                                               | e-mail                        |                                                                                                                                                                                                                                          |
| Module Leader's Acad. Title        |                                               | Module Leader's Qualification |                                                                                                                                                                                                                                          |
| Module Tutor                       |                                               | e-mail                        |                                                                                                                                                                                                                                          |
| Peer Reviewer Name                 | Name                                          | e-mail                        | E-mail                                                                                                                                                                                                                                   |
| Scientific Committee Approval Date | 1/09/2025                                     | Version Number                | 1.0                                                                                                                                                                                                                                      |

| Relation with other Modules       |                                        |          |  |
|-----------------------------------|----------------------------------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                                        |          |  |
| Prerequisite module               | Traffic and Transportation Engineering | Semester |  |
| Co-requisites module              | None                                   | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Module Aims<br>أهداف المادة الدراسية                     | The course aims to study the means and establish systems that achieve organization, safety and efficiency and determine them during human or goods transportation operations in all means of transportation by road, rail, air and sea navigation, by using various engineering techniques with the latest means of communication and technology, including traffic signs, traffic signals, traffic symbols and signs, all with the aim of organizing and facilitating traffic, and preserving lives, time and money. |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | A. Cognitive and educational objectives<br>1. Methods of calculating traffic volumes.<br>2. Methods of calculating vehicle speed.<br>3. Design of road elements.<br>4. Analysis of traffic accidents<br>B. Course specific skill objectives<br>1. Apply quantitative and numerical methods for the purpose of solving engineering problems.<br>2. Use basic knowledge to research new technologies.<br>3. Derive and evaluate information necessary to apply engineering analysis methods to unfamiliar problems. |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | Scientific and research skills are developed through teaching and learning activities. Analytical and problem-solving skills are further developed through a set of problems prepared by the lecturers in small study groups and all work submitted is assessed and responded to.                                                                                                                                                                                                                                 |

|  |                                                                                                                                                                                             |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Interacting within the lecture.</li> <li>• Homework and reports.</li> <li>• Short exams (quizzes).</li> <li>• Semester and final exams.</li> </ul> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <ul style="list-style-type: none"> <li>• The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>• The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>• The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 140 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 60  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 200 |                                                                           |     |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |         |             |                |          |                           |
|---------------------------------------------------|---------|-------------|----------------|----------|---------------------------|
|                                                   |         | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|                                                   | Quizzes | 2           | 10% (10)       | 3 , 7    | All                       |

|                             |                       |      |                  |               |     |
|-----------------------------|-----------------------|------|------------------|---------------|-----|
| <b>Formative assessment</b> | <b>Assignments</b>    | 2    | 10% (10)         | 2,4,6,8,10,12 | All |
|                             | <b>Class activity</b> | 1    | 10% (10)         |               |     |
|                             | <b>Report</b>         | 1    | 10% (10)         |               |     |
| <b>Summative assessment</b> | <b>Midterm Exam</b>   | 1 hr | 10% (10)         | 10            | 1-5 |
|                             | <b>Final Exam</b>     | 2hr  | 50% (50)         | 16            | All |
| <b>Total assessment</b>     |                       |      | 100% (100 Marks) |               |     |

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

|                | Material Covered                              |
|----------------|-----------------------------------------------|
| <b>Week 1</b>  | Introduction                                  |
| <b>Week 2</b>  | Volume subdues                                |
| <b>Week 3</b>  | Speed studies                                 |
| <b>Week 4</b>  | Relationship among speed, volume and density  |
| <b>Week 5</b>  | intersections                                 |
| <b>Week 6</b>  | Traffic control methods                       |
| <b>Week 7</b>  | Sign and marking                              |
| <b>Week 8</b>  | traffic signalized analysis                   |
| <b>Week 9</b>  | traffic signalized design - Webster method    |
| <b>Week 10</b> | Stopping Sight distance                       |
| <b>Week 11</b> | Passing Sight distance                        |
| <b>Week 12</b> | Horizontal curve design                       |
| <b>Week 13</b> | Vertical curve design                         |
| <b>Week 14</b> | Parking study                                 |
| <b>Week 15</b> | Accident study                                |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b> |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|        | Material Covered                                    |
|--------|-----------------------------------------------------|
| Week 1 | • Spot Speed Study Using Radar / Stopwatch          |
| Week 2 | • Traffic Volume Count and Composition Study        |
| Week 3 | • Intersection Delay and Queue Length Analysis      |
| Week 4 | • Travel Time and Delay Study (Floating Car Method) |
| Week 5 | • Pedestrian Volume and Walking Speed Study         |
| Week 6 | • Parking Space Inventory and Duration Study        |
| Week 7 | • Traffic Signal Timing and Coordination Design     |

### Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                                                                                                                                                         | Available in the Library? |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Required Texts    | 1. مبادئ هندسة المرور، د. لمياء عبدالجليل.<br>Traffic Engineering Third Edition by Roger P. Roess, Elena S. Prassas and William R. McShane.                  | Yes                       |
| Recommended Texts | 1. Highway and Traffic Engineering in Developing Countries by Bent Thagesen.<br>2. Traffic and Highway Engineering by Nicholas J. Garber and Lester A. Hoel. | No                        |

### Grading Scheme

مخطط الدرجات

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

| Module Information                 |                      |                 |                                                                                                                                                                                            |                   |
|------------------------------------|----------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| معلومات المادة الدراسية            |                      |                 |                                                                                                                                                                                            |                   |
| Module Title                       | Drainage Engineering |                 | Module Delivery                                                                                                                                                                            |                   |
| Module Type                        | Core                 |                 | √Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                   |
| Module Code                        | CE315                |                 |                                                                                                                                                                                            |                   |
| ECTS Credits                       | 8                    |                 |                                                                                                                                                                                            |                   |
| SWL (hr/sem)                       | 200                  |                 |                                                                                                                                                                                            |                   |
| Module Level                       |                      | 4               |                                                                                                                                                                                            |                   |
| Administering Department           |                      | Type Dept. Code | College                                                                                                                                                                                    | Type College Code |
| Module Leader                      |                      |                 | e-mail                                                                                                                                                                                     |                   |
| Module Leader’s Acad. Title        |                      |                 | Module Leader’s Qualification                                                                                                                                                              |                   |
| Module Tutor                       |                      |                 | e-mail                                                                                                                                                                                     |                   |
| Peer Reviewer Name                 |                      | Name            | e-mail                                                                                                                                                                                     | E-mail            |
| Scientific Committee Approval Date |                      | 1/09/2025       | Version Number                                                                                                                                                                             | 1.0               |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | 1. Clarify the basic concepts of drainage engineering systems and their applications in agricultural fields.<br>2. Gain the ability to address the problems of high groundwater levels.<br>3. Gain basic skills in managing drainage systems and gain experience in designing these systems under different surrounding conditions.<br>4. Gain experience in the difference between the old and modern drainage system and managing the drainage system optimally. |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | 1. Ability to design drainage systems in different ways.<br>2. Ability to think about problems of rising groundwater levels.<br>3. Writing scientific reports and reading charts and tables.<br>This course covers a wide range of different drainage methods, their optimal conditions and design methods with the aim of enriching the knowledge base of the civil engineer in the field of agricultural engineering in a way that enables him to solve potential engineering problems in this field effectively. |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | The main strategy for delivering this module is to encourage student's participation in the exercises while refining and expanding their critical thinking skills. This will be achieved through theoretical lectures, small discussion groups, presentation of scientific films, writing reports, and using the scientific web sites.                                                                                                                                                                              |

|  |                                                                                                                                                                                             |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Interacting within the lecture.</li> <li>• Homework and reports.</li> <li>• Short exams (quizzes).</li> <li>• Semester and final exams.</li> </ul> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <ul style="list-style-type: none"> <li>• The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>• The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>• The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

#### الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

|                                                                                |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 140 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 60  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 200 |                                                                           |     |

### Module Evaluation

#### تقييم المادة الدراسية

|  |             | Time/Number | Weight (Marks) | Week Due      | Relevant Learning Outcome |
|--|-------------|-------------|----------------|---------------|---------------------------|
|  | Quizzes     | 2           | 10% (10)       | 3 , 7         | All                       |
|  | Assignments | 2           | 10% (10)       | 2,4,6,8,10,12 | All                       |

|                             |                       |      |                  |    |     |
|-----------------------------|-----------------------|------|------------------|----|-----|
| <b>Formative assessment</b> | <b>Class activity</b> | 1    | 10% (10)         |    |     |
|                             | <b>Report</b>         | 1    | 10% (10)         |    |     |
| <b>Summative assessment</b> | <b>Midterm Exam</b>   | 1 hr | 10% (10)         | 10 | 1-5 |
|                             | <b>Final Exam</b>     | 2hr  | 50% (50)         | 16 | All |
| <b>Total assessment</b>     |                       |      | 100% (100 Marks) |    |     |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                               |
|-------------------------------------------------------------------|-----------------------------------------------|
|                                                                   | <b>Material Covered</b>                       |
| <b>Week 1</b>                                                     | Introduction to the Drainage Engineering      |
| <b>Week 2</b>                                                     | Introduction to the Drainage Engineering      |
| <b>Week 3</b>                                                     | Introduction to the Drainage Engineering      |
| <b>Week 4</b>                                                     | Drainage systems                              |
| <b>Week 5</b>                                                     | Drainage systems                              |
| <b>Week 6</b>                                                     | Drainage systems                              |
| <b>Week 7</b>                                                     | Design of drain cross sections                |
| <b>Week 8</b>                                                     | Design of drain cross sections                |
| <b>Week 9</b>                                                     | Design of drain cross sections                |
| <b>Week 10</b>                                                    | Distance between the drains                   |
| <b>Week 11</b>                                                    | Distance between the drains                   |
| <b>Week 12</b>                                                    | Distance between the drains                   |
| <b>Week 13</b>                                                    | Vertical drainage                             |
| <b>Week 14</b>                                                    | Vertical drainage                             |
| <b>Week 15</b>                                                    | Vertical drainage                             |
| <b>Week 16</b>                                                    | <b>Preparatory week before the final Exam</b> |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                                                                    | Available in the Library? |
|-------------------|-------------------------------------------------------------------------|---------------------------|
| Required Texts    | كتاب هندسة البزل تأليف الدكتور عبد الستار يونس الدباغ                   | Yes                       |
| Recommended Texts | Irrigation and Drainage Engineering by Peter Waller and Muluneh Yitayew | No                        |
| Websites          |                                                                         |                           |

## Grading Scheme

مخطط الدرجات

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

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

| Module Information                 |                               |                      |                                                                                                                                                                                                                               |  |
|------------------------------------|-------------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية            |                               |                      |                                                                                                                                                                                                                               |  |
| Module Title                       | Numerical Analysis            |                      | Module Delivery                                                                                                                                                                                                               |  |
| Module Type                        | Core                          |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Code                        | CE311                         |                      |                                                                                                                                                                                                                               |  |
| ECTS Credits                       | 8                             |                      |                                                                                                                                                                                                                               |  |
| SWL (hr/sem)                       | 200                           |                      |                                                                                                                                                                                                                               |  |
| Module Level                       | 4                             | Semester of Delivery | 2                                                                                                                                                                                                                             |  |
| Administering Department           | Type Dept. Code               | College              | Type College Code                                                                                                                                                                                                             |  |
| Module Leader                      | e-mail                        |                      |                                                                                                                                                                                                                               |  |
| Module Leader's Acad. Title        | Module Leader's Qualification |                      |                                                                                                                                                                                                                               |  |
| Module Tutor                       | e-mail                        |                      |                                                                                                                                                                                                                               |  |
| Peer Reviewer Name                 | Name                          | e-mail               | E-mail                                                                                                                                                                                                                        |  |
| Scientific Committee Approval Date | 1/09/2025                     | Version Number       | 1.0                                                                                                                                                                                                                           |  |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                     |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | The course aims to identify the following:<br>1- Numerical solution of algebraic equations.<br>2- Taylor series<br>3- Differentiation and integration by numerical methods<br>4- Numerical solution of differential equations<br>5- Finding the mathematical model for a set of points, interpolation and induction |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | A- Knowledge and Understanding<br>A1-Preparing applied engineers in the field of civil engineering who are distinguished by a high level of knowledge and analytical creativity in line with the solid standards adopted globally in ensuring quality and academic accreditation of corresponding engineering programs while adhering to the ethics of the engineering profession.<br>A2- Enabling knowledge and understanding of practical applications according to the course objectives.<br>A3- The ability to build a mathematical model to represent various engineering processes.A3-<br>B. Subject-specific skills<br>B1 - The ability to know and understand the mathematical model of the problem through the differential equation and its solution<br>B2 - The ability to think about solving any problem.<br>B3 - The ability to solve problems using analytical methods for differential equations.<br>B4 - The ability to gain experience in dealing with initial problems and boundary conditions. |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | <ul style="list-style-type: none"> <li>• Readings, self-learning, panel discussions.</li> <li>• Exercises and activities in the lecture.</li> <li>• Homework.</li> <li>• Directing students to some websites to benefit and develop their capabilities.</li> <li>• Conducting seminars to explain and analyze a specific issue and find solutions to it</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

|  |                                                                                                                                                                                                                    |
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|  | <ul style="list-style-type: none"> <li>• Direct questions in a manner (how and why) for the subject during the lecture.</li> <li>• short exams during the theoretical lecture.</li> <li>• Midterm exam.</li> </ul> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <ul style="list-style-type: none"> <li>• The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>• The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>• The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                      |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.</li> <li>• Sudden exams during the theoretical and practical lecture.</li> <li>• Quarterly exams for the theoretical and practical side.</li> <li>• Final exams for the theoretical and practical side.</li> </ul> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 140 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 60  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 200 |                                                                           |     |

| Module Evaluation           |                       |             |                  |               |                           |
|-----------------------------|-----------------------|-------------|------------------|---------------|---------------------------|
| تقييم المادة الدراسية       |                       |             |                  |               |                           |
|                             |                       | Time/Number | Weight (Marks)   | Week Due      | Relevant Learning Outcome |
| <b>Formative assessment</b> | <b>Quizzes</b>        | 2           | 10% (10)         | 3 , 7         | All                       |
|                             | <b>Assignments</b>    | 2           | 10% (10)         | 2,4,6,8,10,12 | All                       |
|                             | <b>Class activity</b> | 1           | 10% (10)         |               |                           |
|                             | <b>Report</b>         | 1           | 10% (10)         |               |                           |
| <b>Summative assessment</b> | <b>Midterm Exam</b>   | 1 hr        | 10% (10)         | 10            | 1-5                       |
|                             | <b>Final Exam</b>     | 2hr         | 50% (50)         | 16            | All                       |
| <b>Total assessment</b>     |                       |             | 100% (100 Marks) |               |                           |

| Delivery Plan (Weekly Syllabus) |                                           |
|---------------------------------|-------------------------------------------|
| المناهج الأسبوعي النظري         |                                           |
|                                 | Material Covered                          |
| <b>Week 1</b>                   | Numerical solution of algebraic equations |
| <b>Week 2</b>                   | Numerical solution of algebraic equations |
| <b>Week 3</b>                   | Numerical solution of algebraic equations |
| <b>Week 4</b>                   | Numerical solution of algebraic equations |
| <b>Week 5</b>                   | Numerical solution of algebraic equations |
| <b>Week 6</b>                   | Numerical solution of algebraic equations |
| <b>Week 7</b>                   | Taylor Series                             |

|                |                                                                                 |
|----------------|---------------------------------------------------------------------------------|
| <b>Week 8</b>  | Numerical Derivation and Integration                                            |
| <b>Week 9</b>  | Numerical Derivation and Integration                                            |
| <b>Week 10</b> | Numerical Derivation and Integration                                            |
| <b>Week 11</b> | Numerical Solution of Differential Equations                                    |
| <b>Week 12</b> | Numerical Solution of Differential Equations                                    |
| <b>Week 13</b> | Numerical Solution of Differential Equations                                    |
| <b>Week 14</b> | Finding the Mathematical Model for a Set of Points, Interpolation and Induction |
| <b>Week 15</b> | Finding the Mathematical Model for a Set of Points, Interpolation and Induction |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                   |

| Delivery Plan (Weekly Lab. Syllabus) |                                                           |                           |
|--------------------------------------|-----------------------------------------------------------|---------------------------|
| المنهاج الاسبوعي للمختبر             |                                                           |                           |
|                                      | Material Covered                                          |                           |
| Week 1                               |                                                           |                           |
| Week 2                               |                                                           |                           |
| Week 3                               |                                                           |                           |
| Week 4                               |                                                           |                           |
| Week 5                               |                                                           |                           |
| Week 6                               |                                                           |                           |
| Week 7                               |                                                           |                           |
| Learning and Teaching Resources      |                                                           |                           |
| مصادر التعلم والتدريس                |                                                           |                           |
|                                      | Text                                                      | Available in the Library? |
| Required Texts                       | MATHEMATICS, NINTH EDITION, JOHN WILEY & SONS, INC., 2006 | Yes                       |
| Recommended Texts                    | Reputable websites.                                       | No                        |
| Websites                             |                                                           |                           |

## Grading Scheme

### مخطط الدرجات

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

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

| Module Information                 |                             |                               |                                                                                                                                                                                                                               |
|------------------------------------|-----------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                             |                               |                                                                                                                                                                                                                               |
| Module Title                       | <b>Engineering Analysis</b> |                               | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | Core                        |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>CE311</b>                |                               |                                                                                                                                                                                                                               |
| ECTS Credits                       | 8                           |                               |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | <b>200</b>                  |                               |                                                                                                                                                                                                                               |
| Module Level                       | 4                           | Semester of Delivery          | 2                                                                                                                                                                                                                             |
| Administering Department           | Type Dept. Code             | College                       | Type College Code                                                                                                                                                                                                             |
| Module Leader                      | e-mail                      |                               |                                                                                                                                                                                                                               |
| Module Leader's Acad. Title        |                             | Module Leader's Qualification |                                                                                                                                                                                                                               |
| Module Tutor                       | e-mail                      |                               |                                                                                                                                                                                                                               |
| Peer Reviewer Name                 | Name                        | e-mail                        | E-mail                                                                                                                                                                                                                        |
| Scientific Committee Approval Date | 1/09/2025                   | Version Number                | 1.0                                                                                                                                                                                                                           |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | The course aims to identify the following:<br>1- First order ordinary differential equations.<br>2- Engineering applications of first order differential equations<br>3- Second and higher order ordinary differential equations with fixed and variable coefficients<br>4- Engineering applications of second order differential equations<br>5- Fourier series<br>6- Partial differential equations |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <p>A- Knowledge and Understanding</p> <p>A1-Preparing applied engineers in the field of civil engineering who are distinguished by a high level of knowledge and analytical creativity in line with the solid standards adopted globally in ensuring quality and academic accreditation of corresponding engineering programs while adhering to the ethics of the engineering profession.</p> <p>A2- Enabling knowledge and understanding of practical applications according to the course objectives.</p> <p>A3- The ability to build a mathematical model to represent various engineering processes.A3-</p> <p>B. Subject-specific skills</p> <p>B1 - The ability to know and understand the mathematical model of the problem through the differential equation and its solution</p> <p>B2 - The ability to think about solving any problem.</p> <p>B3 - The ability to solve problems using analytical methods for differential equations.</p> <p>B4 - The ability to gain experience in dealing with initial problems and boundary conditions.</p> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <ul style="list-style-type: none"> <li>• Readings, self-learning, panel discussions.</li> <li>• Exercises and activities in the lecture.</li> <li>• Homework.</li> <li>• Directing students to some websites to benefit and develop their capabilities.</li> <li>• Conducting seminars to explain and analyze a specific issue and find solutions to it</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

|  |                                                                                                                                                                                                                    |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Direct questions in a manner (how and why) for the subject during the lecture.</li> <li>• short exams during the theoretical lecture.</li> <li>• Midterm exam.</li> </ul> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Strategies</b></p>                                                          | <ul style="list-style-type: none"> <li>• The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>• The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>• The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 140 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 60  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><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)         | 3 , 7         | All                       |
|                       | Assignments    | 2           | 10% (10)         | 2,4,6,8,10,12 | All                       |
|                       | Class activity | 1           | 10% (10)         |               |                           |
|                       | Report         | 1           | 10% (10)         |               |                           |
| Summative assessment  | Midterm Exam   | 1 hr        | 10% (10)         | 10            | 1-5                       |
|                       | 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 Differential Equations       |
| Week 2                          | First order ordinary differential equations  |
| Week 3                          | First order ordinary differential equations  |
| Week 4                          | First order ordinary differential equations  |
| Week 5                          | Applications of DEs                          |
| Week 6                          | Applications of differential equations       |
| Week 7                          | Higher order ordinary differential equations |
| Week 8                          | Higher order ordinary differential equations |

|                |                                                              |
|----------------|--------------------------------------------------------------|
| <b>Week 9</b>  | Higher order ordinary differential equations                 |
| <b>Week 10</b> | Applications of higher order ordinary differential equations |
| <b>Week 11</b> | Applications of higher order ordinary differential equations |
| <b>Week 12</b> | Applications of higher order ordinary differential equations |
| <b>Week 13</b> | Fourier Series                                               |
| <b>Week 14</b> | Partial Differential Equations                               |
| <b>Week 15</b> | Partial Differential Equations                               |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                |

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

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                                           |                           |
|-----------------------------------------------------------------|-----------------------------------------------------------|---------------------------|
|                                                                 | Text                                                      | Available in the Library? |
| <b>Required Texts</b>                                           | MATHEMATICS, NINTH EDITION, JOHN WILEY & SONS, INC., 2006 | Yes                       |
| <b>Recommended Texts</b>                                        | Reputable websites.                                       | No                        |
| <b>Websites</b>                                                 |                                                           |                           |

## Grading Scheme

### مخطط الدرجات

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

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

| Module Information                 |                                      |                      |                                                                                                                                                                                                                               |
|------------------------------------|--------------------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                                      |                      |                                                                                                                                                                                                                               |
| Module Title                       | <b>Reinforced concrete designs-1</b> |                      | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | Core                                 |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>CE314</b>                         |                      |                                                                                                                                                                                                                               |
| ECTS Credits                       | 10                                   |                      |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | <b>250</b>                           |                      |                                                                                                                                                                                                                               |
| Module Level                       | 4                                    | Semester of Delivery | 2                                                                                                                                                                                                                             |
| Administering Department           | Type Dept. Code                      | College              | Type College Code                                                                                                                                                                                                             |
| Module Leader                      | e-mail                               |                      |                                                                                                                                                                                                                               |
| Module Leader's Acad. Title        | Module Leader's Qualification        |                      |                                                                                                                                                                                                                               |
| Module Tutor                       | e-mail                               |                      |                                                                                                                                                                                                                               |
| Peer Reviewer Name                 | Name                                 | e-mail               | E-mail                                                                                                                                                                                                                        |
| Scientific Committee Approval Date | 1/09/2025                            | Version Number       | 1.0                                                                                                                                                                                                                           |

| Relation with other Modules       |                               |          |  |
|-----------------------------------|-------------------------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                               |          |  |
| Prerequisite module               | Reinforced concrete designs-1 | Semester |  |
| Co-requisites module              | None                          | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | A- Cognitive objectives<br>A1- Apply basic knowledge in understanding the analysis and design of two-way reinforced concrete slabs.<br>A2- Analyze and design different reinforced concrete columns with central and eccentric loading.<br>A3- Apply methods for calculating the overlap distances of reinforcing steel and the span distance inside concrete beams when cutting a number of reinforcing bars.<br>B- Course specific skill objectives. |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | <p>B1- Apply mathematical methods approved in international codes for analysis and design purposes.</p> <p>B2- Use basic knowledge to research new technologies.</p> <p>B3- Use simplified methods by relying on diagrams and tables to design columns subjected to central and eccentric loads.</p>                                                               |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | <ul style="list-style-type: none"> <li>• Readings, self-learning, panel discussions.</li> <li>• Exercises and activities in the lecture.</li> <li>• Homework.</li> <li>• Directing students to some websites to benefit and develop their capabilities.</li> <li>• Conducting seminars to explain and analyze a specific issue and find solutions to it</li> </ul> |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | <ul style="list-style-type: none"> <li>• Interacting within the lecture.</li> <li>• Homework and reports.</li> <li>• Short exams (quizzes).</li> <li>• Semester and final exams.</li> </ul>                                                                                                                                                                        |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>• The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>• The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |
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| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <ul style="list-style-type: none"> <li>• The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>• The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>• The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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|  | <ul style="list-style-type: none"> <li>• Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.</li> <li>• Sudden exams during the theoretical and practical lecture.</li> <li>• Quarterly exams for the theoretical and practical side.</li> <li>• Final exams for the theoretical and practical side.</li> </ul> <p>D. General and Transferable Skills (other skills relevant to employability and personal development)</p> <p>D1- Develop the student's ability to perform the duties and deliver them on time</p> <p>D2 - Logical and programmatic thinking to find programmatic solutions to various problems</p> <p>D3 - developing the student's ability to dialogue and debate</p> <p>D4 - Develop the student's ability to deal with modern technology, especially the Internet</p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 160 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 90  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

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

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

|         | Material Covered                         |
|---------|------------------------------------------|
| Week 1  | Introduction                             |
| Week 2  | Introduction                             |
| Week 3  | Introduction                             |
| Week 4  | Introduction                             |
| Week 5  | Working Stress Method                    |
| Week 6  | Working Stress Method                    |
| Week 7  | Flexural Beam Analysis And Design        |
| Week 8  | Flexural Beam Analysis And Design        |
| Week 9  | Application Examples                     |
| Week 10 | Flexural Beam Analysis And Design        |
| Week 11 | Flexural Beam Analysis And Design        |
| Week 12 | Flexural Analysis And Design of T-Beams. |
| Week 13 | Shear and Diagonal Tension in Beams.     |
| Week 14 | Shear and Diagonal Tension in Beams.     |
| Week 15 | Design and Analysis of slabs.            |
| Week 16 | Preparatory week before the final Exam   |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                                                            | Available in the Library? |
|--------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | 1-Structural Concrete Theory and Design, By Nadim Hasson ,Akthem Aktham Al manseer,6 <sup>th</sup> Edition 2015 | Yes                       |
| <b>Recommended Texts</b> | 2- Reinforced concrete Design ,7 <sup>th</sup> Edition 2007 By Chu Kai Wang                                     | No                        |
| <b>Websites</b>          |                                                                                                                 |                           |

## Grading Scheme

مخطط الدرجات

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

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

| Module Information                 |                                      |                      |                   |                                                                                                                                                                                                                               |
|------------------------------------|--------------------------------------|----------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                                      |                      |                   |                                                                                                                                                                                                                               |
| Module Title                       | <b>Reinforced concrete designs-2</b> |                      |                   | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | Core                                 |                      |                   | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | CE314                                |                      |                   |                                                                                                                                                                                                                               |
| ECTS Credits                       | 10                                   |                      |                   |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | 250                                  |                      |                   |                                                                                                                                                                                                                               |
| Module Level                       | 4                                    | Semester of Delivery |                   | 2                                                                                                                                                                                                                             |
| Administering Department           | Type Dept. Code                      | College              | Type College Code |                                                                                                                                                                                                                               |
| Module Leader                      | e-mail                               |                      |                   |                                                                                                                                                                                                                               |
| Module Leader's Acad. Title        | Module Leader's Qualification        |                      |                   |                                                                                                                                                                                                                               |
| Module Tutor                       | e-mail                               |                      |                   |                                                                                                                                                                                                                               |
| Peer Reviewer Name                 | Name                                 | e-mail               | E-mail            |                                                                                                                                                                                                                               |
| Scientific Committee Approval Date | 1/09/2025                            | Version Number       | 1.0               |                                                                                                                                                                                                                               |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | A- Cognitive objectives<br>A1- Apply basic knowledge in understanding the analysis and design of two-way reinforced concrete slabs.<br>A2- Analyze and design different reinforced concrete columns with central and eccentric loading.<br>A3- Apply methods for calculating the overlap distances of reinforcing steel and the span distance inside concrete beams when cutting a number of reinforcing bars.<br>B- Course specific skill objectives.<br>B1- Apply mathematical methods approved in international codes for analysis and |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | <p>design purposes.</p> <p>B2- Use basic knowledge to research new technologies.</p> <p>B3- Use simplified methods by relying on diagrams and tables to design columns subjected to central and eccentric loads.</p>                                                                                                                                               |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | <ul style="list-style-type: none"> <li>• Readings, self-learning, panel discussions.</li> <li>• Exercises and activities in the lecture.</li> <li>• Homework.</li> <li>• Directing students to some websites to benefit and develop their capabilities.</li> <li>• Conducting seminars to explain and analyze a specific issue and find solutions to it</li> </ul> |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | <ul style="list-style-type: none"> <li>• Interacting within the lecture.</li> <li>• Homework and reports.</li> <li>• Short exams (quizzes).</li> <li>• Semester and final exams.</li> </ul>                                                                                                                                                                        |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>• The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>• The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <ul style="list-style-type: none"> <li>• The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>• The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>• The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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|  | <ul style="list-style-type: none"> <li>• Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.</li> <li>• Sudden exams during the theoretical and practical lecture.</li> <li>• Quarterly exams for the theoretical and practical side.</li> <li>• Final exams for the theoretical and practical side.</li> </ul> <p>D. General and Transferable Skills (other skills relevant to employability and personal development)</p> <p>D1- Develop the student's ability to perform the duties and deliver them on time</p> <p>D2 - Logical and programmatic thinking to find programmatic solutions to various problems</p> <p>D3 - developing the student's ability to dialogue and debate</p> <p>D4 - Develop the student's ability to deal with modern technology, especially the Internet</p> |
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| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 160 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 90  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

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

| Delivery Plan (Weekly Syllabus) |                  |
|---------------------------------|------------------|
| المنهاج الاسبوعي النظري         |                  |
|                                 | Material Covered |
| Week 1                          | Intiontrodion    |

|                |                                               |
|----------------|-----------------------------------------------|
| <b>Week 2</b>  | Two way slabs                                 |
| <b>Week 3</b>  | Two way slabs                                 |
| <b>Week 4</b>  | Two way slabs Analysis                        |
| <b>Week 5</b>  | Two way slabs Design                          |
| <b>Week 6</b>  | Practical Examples                            |
| <b>Week 7</b>  | Flexural Beam Analysis And Design             |
| <b>Week 8</b>  | Introduction Columns                          |
| <b>Week 9</b>  | Application Examples                          |
| <b>Week 10</b> | Analysis and Design of Column                 |
| <b>Week 11</b> | Application Examples                          |
| <b>Week 12</b> | Analysis and Design of Column                 |
| <b>Week 13</b> | Application Examples                          |
| <b>Week 14</b> | Development length                            |
| <b>Week 15</b> | Development length                            |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b> |

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

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                                                            | Available in the Library? |
|--------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | 1-Structural Concrete Theory and Design, By Nadim Hasson ,Akthem Aktham Al manseer,6 <sup>th</sup> Edition 2015 | Yes                       |
| <b>Recommended Texts</b> | 2- Reinforced concrete Design ,7 <sup>th</sup> Edition 2007 By Chu K ai Wang                                    | No                        |
| <b>Websites</b>          |                                                                                                                 |                           |

## Grading Scheme

مخطط الدرجات

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

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

| Module Information                 |                       |                               |                                                                                                                                                                                                                               |
|------------------------------------|-----------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                       |                               |                                                                                                                                                                                                                               |
| Module Title                       | Theory of Structure 1 |                               | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | Core                  |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | CE312                 |                               |                                                                                                                                                                                                                               |
| ECTS Credits                       | 8                     |                               |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | 200                   |                               |                                                                                                                                                                                                                               |
| Module Level                       | 4                     | Semester of Delivery          | 2                                                                                                                                                                                                                             |
| Administering Department           | Type Dept. Code       | College                       | Type College Code                                                                                                                                                                                                             |
| Module Leader                      |                       | e-mail                        |                                                                                                                                                                                                                               |
| Module Leader's Acad. Title        |                       | Module Leader's Qualification |                                                                                                                                                                                                                               |
| Module Tutor                       |                       | e-mail                        |                                                                                                                                                                                                                               |
| Peer Reviewer Name                 | Name                  | e-mail                        | E-mail                                                                                                                                                                                                                        |
| Scientific Committee Approval Date | 1/09/2025             | Version Number                | 1.0                                                                                                                                                                                                                           |

| Relation with other Modules       |                       |          |  |
|-----------------------------------|-----------------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                       |          |  |
| Prerequisite module               | Theory of Structure 1 | Semester |  |
| Co-requisites module              | None                  | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | The course aims to expand on the concepts identified in Structural Theory-1, where the analysis of statically indeterminate structures is reviewed by imposing the conditions of the deformation form on the equilibrium of the structure. The methods used include the two basic approaches in analysis methods: the group of force methods (such as the method of compatible deformations) and the group of displacement methods (such as the slope-slump method and the method of moment distribution). |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <p>A- Cognitive objectives</p> <p>A-1 Knowing the concept of a group of force methods in the analysis of statically indeterminate structures, as well as knowing the method of compatible deformations and applying it to statically indeterminate thresholds.</p> <p>A-2 Knowing the concept of a group of displacement methods in the analysis of statically indeterminate structures, and knowing the slope-slump method and applying it to indeterminate thresholds and structures.</p> <p>A-3 Knowing the method of moment distribution and applying it to indeterminate thresholds and structures.</p> <p>A-4 Knowing the concept of strain energy and knowing Castellino's theories and applying them to the analysis of indeterminate thresholds and structures.</p> <p>B- Course specific skill objectives.</p> <p>B-1 The ability to analyze statically indeterminate structures and evaluate reaction components.</p> <p>B-2 The ability to draw shear force and bending moment diagrams for statically indeterminate structures.</p> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <p>The main strategy for delivering this module is to encourage student's participation in the exercises while refining and expanding their critical thinking skills. This will be achieved through theoretical lectures, small discussion groups, presentation of scientific films, writing reports, and using the scientific web sites.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|  |                                                                                                                                                                                                                                                                                                                                                                    |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Readings, self-learning, panel discussions.</li> <li>• Exercises and activities in the lecture.</li> <li>• Homework.</li> <li>• Directing students to some websites to benefit and develop their capabilities.</li> <li>• Conducting seminars to explain and analyze a specific issue and find solutions to it</li> </ul> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Strategies</b></p>                                                          | <ul style="list-style-type: none"> <li>• The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>• The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>• The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.</li> <li>• Sudden exams during the theoretical and practical lecture.</li> <li>• Quarterly exams for the theoretical and practical side.</li> <li>• Final exams for the theoretical and practical side.</li> </ul> <p>D. General and Transferable Skills (other skills relevant to employability and personal development)</p> <p>D1- Develop the student's ability to perform the duties and deliver them on time</p> <p>D2 - Logical and programmatic thinking to find programmatic solutions to various problems</p> <p>D3 - developing the student's ability to dialogue and debate</p> <p>D4 - Develop the student's ability to deal with modern technology, especially the Internet</p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 140 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 60  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 200 |                                                                           |     |

| Module Evaluation           |                       |             |                  |               |                           |
|-----------------------------|-----------------------|-------------|------------------|---------------|---------------------------|
| تقييم المادة الدراسية       |                       |             |                  |               |                           |
|                             |                       | Time/Number | Weight (Marks)   | Week Due      | Relevant Learning Outcome |
| <b>Formative assessment</b> | <b>Quizzes</b>        | 2           | 10% (10)         | 3 , 7         | All                       |
|                             | <b>Assignments</b>    | 2           | 10% (10)         | 2,4,6,8,10,12 | All                       |
|                             | <b>Class activity</b> | 1           | 10% (10)         |               |                           |
|                             | <b>Report</b>         | 1           | 10% (10)         |               |                           |
| <b>Summative assessment</b> | <b>Midterm Exam</b>   | 1 hr        | 10% (10)         | 10            | 1-5                       |
|                             | <b>Final Exam</b>     | 2hr         | 50% (50)         | 16            | All                       |
| <b>Total assessment</b>     |                       |             | 100% (100 Marks) |               |                           |

| Delivery Plan (Weekly Syllabus) |                  |
|---------------------------------|------------------|
| المنهاج الاسبوعي النظري         |                  |
|                                 | Material Covered |
| <b>Week 1</b>                   | Force Methods    |

|                |                                                                                |
|----------------|--------------------------------------------------------------------------------|
| <b>Week 2</b>  | Method of Consistent Deformations                                              |
| <b>Week 3</b>  | Method of Consistent Deformations                                              |
| <b>Week 4</b>  | Method of Consistent Deformations                                              |
| <b>Week 5</b>  | Introduction to displacement methods and derivation of slope-deflection method |
| <b>Week 6</b>  | Application of slope-deflection method to beams and non-sway frames            |
| <b>Week 7</b>  | Displacement Methods: Moment Distribution                                      |
| <b>Week 8</b>  | Displacement Methods: Moment Distribution                                      |
| Week 9         | Displacement Methods: Moment Distribution                                      |
| Week 10        | Displacement Methods: Moment Distribution                                      |
| <b>Week 11</b> | Displacement Methods: Moment Distribution                                      |
| <b>Week 12</b> | Energy Methods                                                                 |
| <b>Week 13</b> | Energy Methods                                                                 |
| <b>Week 14</b> | Energy Methods                                                                 |
| <b>Week 15</b> | Energy Methods                                                                 |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                  |

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

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                                                              | Available in the Library? |
|--------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | Elementary Theory of Structures, Yan-Yu Hsieh, Prentice Hall<br>Structural Analysis, R.C. Hibbeler, Prentice Hall | Yes                       |
| <b>Recommended Texts</b> |                                                                                                                   | No                        |
| <b>Websites</b>          |                                                                                                                   |                           |

## Grading Scheme

مخطط الدرجات

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

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

| Module Information                 |                       |                      |                               |                                                                                                                                                                                                                               |
|------------------------------------|-----------------------|----------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                       |                      |                               |                                                                                                                                                                                                                               |
| Module Title                       | Theory of Structure 2 |                      |                               | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | Core                  |                      |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | CE312                 |                      |                               |                                                                                                                                                                                                                               |
| ECTS Credits                       | 8                     |                      |                               |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | 200                   |                      |                               |                                                                                                                                                                                                                               |
| Module Level                       | 4                     | Semester of Delivery |                               | 2                                                                                                                                                                                                                             |
| Administering Department           | Type Dept. Code       | College              | Type College Code             |                                                                                                                                                                                                                               |
| Module Leader                      |                       |                      | e-mail                        |                                                                                                                                                                                                                               |
| Module Leader's Acad. Title        |                       |                      | Module Leader's Qualification |                                                                                                                                                                                                                               |
| Module Tutor                       |                       |                      | e-mail                        |                                                                                                                                                                                                                               |
| Peer Reviewer Name                 | Name                  | e-mail               | E-mail                        |                                                                                                                                                                                                                               |
| Scientific Committee Approval Date | 1/09/2025             | Version Number       | 1.0                           |                                                                                                                                                                                                                               |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | The course aims to expand on the concepts identified in Structural Theory-1, where the analysis of statically indeterminate structures is reviewed by imposing the conditions of the deformation form on the equilibrium of the structure. The methods used include the two basic approaches in analysis methods: the group of force methods (such as the method of compatible deformations) and the group of displacement methods (such as the slope-slung method and the method of moment distribution). |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <p>A- Cognitive objectives</p> <p>A-1 Knowing the concept of a group of force methods in the analysis of statically indeterminate structures, as well as knowing the method of compatible deformations and applying it to statically indeterminate thresholds.</p> <p>A-2 Knowing the concept of a group of displacement methods in the analysis of statically indeterminate structures, and knowing the slope-slump method and applying it to indeterminate thresholds and structures.</p> <p>A-3 Knowing the method of moment distribution and applying it to indeterminate thresholds and structures.</p> <p>A-4 Knowing the concept of strain energy and knowing Castellino's theories and applying them to the analysis of indeterminate thresholds and structures.</p> <p>B- Course specific skill objectives.</p> <p>B-1 The ability to analyze statically indeterminate structures and evaluate reaction components.</p> <p>B-2 The ability to draw shear force and bending moment diagrams for statically indeterminate structures.</p> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <p>The main strategy for delivering this module is to encourage student's participation in the exercises while refining and expanding their critical thinking skills. This will be achieved through theoretical lectures, small discussion groups, presentation of scientific films, writing reports, and using the scientific web sites.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|  |                                                                                                                                                                                                                                                                                                                                                                    |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Readings, self-learning, panel discussions.</li> <li>• Exercises and activities in the lecture.</li> <li>• Homework.</li> <li>• Directing students to some websites to benefit and develop their capabilities.</li> <li>• Conducting seminars to explain and analyze a specific issue and find solutions to it</li> </ul> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Strategies</b></p>                                                          | <ul style="list-style-type: none"> <li>• The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>• The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>• The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Direct questions in a manner (how and why) for the subject during the theoretical and practical lecture.</li> <li>• Sudden exams during the theoretical and practical lecture.</li> <li>• Quarterly exams for the theoretical and practical side.</li> <li>• Final exams for the theoretical and practical side.</li> </ul> <p>D. General and Transferable Skills (other skills relevant to employability and personal development)</p> <p>D1- Develop the student's ability to perform the duties and deliver them on time</p> <p>D2 - Logical and programmatic thinking to find programmatic solutions to various problems</p> <p>D3 - developing the student's ability to dialogue and debate</p> <p>D4 - Develop the student's ability to deal with modern technology, especially the Internet</p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 140 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 60  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 200 |                                                                           |     |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                       |             |                  |               |                           |
|---------------------------------------------------|-----------------------|-------------|------------------|---------------|---------------------------|
|                                                   |                       | Time/Number | Weight (Marks)   | Week Due      | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | <b>Quizzes</b>        | 2           | 10% (10)         | 3 , 7         | All                       |
|                                                   | <b>Assignments</b>    | 2           | 10% (10)         | 2,4,6,8,10,12 | All                       |
|                                                   | <b>Class activity</b> | 1           | 10% (10)         |               |                           |
|                                                   | <b>Report</b>         | 1           | 10% (10)         |               |                           |
| <b>Summative assessment</b>                       | <b>Midterm Exam</b>   | 1 hr        | 10% (10)         | 10            | 1-5                       |
|                                                   | <b>Final Exam</b>     | 2hr         | 50% (50)         | 16            | All                       |
| <b>Total assessment</b>                           |                       |             | 100% (100 Marks) |               |                           |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                                |
|-------------------------------------------------------------------|------------------------------------------------|
|                                                                   | <b>Material Covered</b>                        |
| <b>Week 1</b>                                                     | Introduction to force methods    Force Methods |

|                |                                               |
|----------------|-----------------------------------------------|
| <b>Week 2</b>  | Method of Consistent Deformations             |
| <b>Week 3</b>  | Method of Consistent Deformations             |
| <b>Week 4</b>  | Method of Consistent Deformations             |
| <b>Week 5</b>  | Displacement Methods: Slope-Deflection        |
| <b>Week 6</b>  | Displacement Methods: Slope-Deflection        |
| <b>Week 7</b>  | Displacement Methods: Moment Distribution     |
| <b>Week 8</b>  | Displacement Methods: Moment Distribution     |
| Week 9         | Displacement Methods: Moment Distribution     |
| Week 10        | Displacement Methods: Moment Distribution     |
| <b>Week 11</b> | Displacement Methods: Moment Distribution     |
| <b>Week 12</b> | Energy Methods                                |
| <b>Week 13</b> | Energy Methods                                |
| <b>Week 14</b> | Energy Methods                                |
| <b>Week 15</b> | Energy Methods                                |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b> |

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

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                                                              | Available in the Library? |
|--------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | Elementary Theory of Structures, Yan-Yu Hsieh, Prentice Hall<br>Structural Analysis, R.C. Hibbeler, Prentice Hall | Yes                       |
| <b>Recommended Texts</b> |                                                                                                                   | No                        |
| <b>Websites</b>          |                                                                                                                   |                           |

## Grading Scheme

مخطط الدرجات

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

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

| Module Information                 |                               |                |                               |                                                                                                                                                                                                                               |
|------------------------------------|-------------------------------|----------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                               |                |                               |                                                                                                                                                                                                                               |
| Module Title                       | <b>Engineering Management</b> |                |                               | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | Core                          |                |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>CE316</b>                  |                |                               |                                                                                                                                                                                                                               |
| ECTS Credits                       | 4                             |                |                               |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | <b>100</b>                    |                |                               |                                                                                                                                                                                                                               |
| Module Level                       | 4                             |                | Semester of Delivery          | 2                                                                                                                                                                                                                             |
| Administering Department           | Type Dept. Code               | College        | Type College Code             |                                                                                                                                                                                                                               |
| Module Leader                      |                               |                | e-mail                        |                                                                                                                                                                                                                               |
| Module Leader's Acad. Title        |                               |                | Module Leader's Qualification |                                                                                                                                                                                                                               |
| Module Tutor                       |                               |                | e-mail                        |                                                                                                                                                                                                                               |
| Peer Reviewer Name                 | Name                          | e-mail         | E-mail                        |                                                                                                                                                                                                                               |
| Scientific Committee Approval Date | 1/09/2025                     | Version Number | 1.0                           |                                                                                                                                                                                                                               |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                |
| Module Aims<br>أهداف المادة الدراسية                     | Teaching undergraduate students how to deal with applied engineering programs such as the EPANET program used to analyze and For water network design, as well as the Microsoft Project program used in planning construction projects, estimating costs and project completion time, and controlling projects |

|                                                                  |                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | Learning outcome<br>1- Teaching students how to deal with construction programs in an integrated manner and comparing with the theoretical study to design and analyze For water network design.<br>2- Teaching students how to create quantity schedules for construction projects by controlling the workflow |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | Scientific and research skills are developed through teaching and learning activities. Analytical and problem-solving skills are further developed through a set of problems prepared by the lecturers in small study groups and all work submitted is assessed and responded to.                               |

### Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <ul style="list-style-type: none"> <li>The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> <li>The method of laboratory display using special devices for measuring the different properties of the substance under experiment.</li> </ul> |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

|                                                                                |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 60  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 40  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 100 |                                                                           |     |

### Module Evaluation

تقييم المادة الدراسية

|                             |                       | Time/Number | Weight (Marks) | Week Due      | Relevant Learning Outcome |
|-----------------------------|-----------------------|-------------|----------------|---------------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>        | 2           | 10% (10)       | 3 , 7         | All                       |
|                             | <b>Assignments</b>    | 2           | 10% (10)       | 2,4,6,8,10,12 | All                       |
|                             | <b>Class activity</b> | 1           | 10% (10)       |               |                           |
|                             | <b>Report</b>         | 1           | 10% (10)       |               |                           |

|                             |                     |      |                  |    |     |
|-----------------------------|---------------------|------|------------------|----|-----|
| <b>Summative assessment</b> | <b>Midterm Exam</b> | 1 hr | 10% (10)         | 10 | 1-5 |
|                             | <b>Final Exam</b>   | 2hr  | 50% (50)         | 16 | All |
| <b>Total assessment</b>     |                     |      | 100% (100 Marks) |    |     |
|                             |                     |      |                  |    |     |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                                   |
|-------------------------------------------------------------------|---------------------------------------------------|
|                                                                   | <b>Material Covered</b>                           |
| <b>Week 1</b>                                                     | Introduction to project management                |
| <b>Week 2</b>                                                     | Introduction to project management                |
| <b>Week 3</b>                                                     | Project planning                                  |
| <b>Week 4</b>                                                     | Project planning                                  |
| <b>Week 5</b>                                                     | Project planning                                  |
| <b>Week 6</b>                                                     | Project planning                                  |
| <b>Week 7</b>                                                     | Bar chart                                         |
| <b>Week 8</b>                                                     | Bar chart                                         |
| Week 9                                                            | (Gantt chart)                                     |
| Week 10                                                           | How to manage project resources in a (Scheduling) |
| <b>Week 11</b>                                                    | How to solve the diagram in a way ( PERT )        |
| <b>Week 12</b>                                                    | How to solve the diagram in a way ( PERT )        |
| <b>Week 13</b>                                                    | How to draw recurring charts<br>LOB method        |
| <b>Week 14</b>                                                    | How to draw recurring charts<br>LOB method        |
| <b>Week 15</b>                                                    | How to draw recurring charts<br>LOB method        |
| <b>Week 16</b>                                                    | <b>Preparatory week before the final Exam</b>     |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                                                                                                                                                                                                                                                                                                                                                | Available in the Library? |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Required Texts    | A Guide to the project management body of knowledge - PMI                                                                                                                                                                                                                                                                                           | Yes                       |
| Recommended Texts | 1. Project Management, A Systems Approach to Planning, Scheduling, and Controlling, 10th edition, KERZNER<br>2. Principles of Construction management By: Roy Pitcher<br>3. Construction Planning, Programming and Control by Brian Cooke<br>4. Operations Management Creating Value Along the Supply Chain Russell - Chapter 9: Project management | No                        |
| Websites          |                                                                                                                                                                                                                                                                                                                                                     |                           |

## Grading Scheme

مخطط الدرجات

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

نماذج وصف المواد الدراسية-المرحلة الرابعة-قسم الهندسة المدنية

| Module Information                 |                                 |                      |                                                                                                                                                                                                                               |  |
|------------------------------------|---------------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية            |                                 |                      |                                                                                                                                                                                                                               |  |
| Module Title                       | <b>Foundation engineering I</b> |                      | Module Delivery                                                                                                                                                                                                               |  |
| Module Type                        | Core                            |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Code                        | <b>CE412</b>                    |                      |                                                                                                                                                                                                                               |  |
| ECTS Credits                       | <b>10</b>                       |                      |                                                                                                                                                                                                                               |  |
| SWL (hr/sem)                       | <b>250</b>                      |                      |                                                                                                                                                                                                                               |  |
| Module Level                       | 4                               | Semester of Delivery | 1                                                                                                                                                                                                                             |  |
| Administering Department           | Type Dept. Code                 | College              | Type College Code                                                                                                                                                                                                             |  |
| Module Leader                      |                                 |                      | e-mail                                                                                                                                                                                                                        |  |
| Module Leader's Acad. Title        |                                 |                      | Module Leader's Qualification                                                                                                                                                                                                 |  |
| Module Tutor                       |                                 |                      | e-mail                                                                                                                                                                                                                        |  |
| Peer Reviewer Name                 | Name                            | e-mail               | E-mail                                                                                                                                                                                                                        |  |
| Scientific Committee Approval Date | 1/09/2025                       | Version Number       | 1.0                                                                                                                                                                                                                           |  |

| Relation with other Modules       |                 |          |  |
|-----------------------------------|-----------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                 |          |  |
| Prerequisite module               | Soil Mechanics  | Semester |  |
|                                   | Concrete Design |          |  |
| Co-requisites module              | None            | Semester |  |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>                      | <p>This course is intended to;</p> <ol style="list-style-type: none"> <li>1. To evaluate the general suitability of the site and enable adequate and economical design for the proposed project</li> <li>2. Calculate the safe bearing capacity of soils.</li> <li>3. Estimate the settlement of shallow foundations</li> <li>4. Estimate the size of shallow foundations to satisfy bearing capacity and settlement criteria.</li> <li>5. Provide the steps of structural design for shallow foundations.</li> </ol>                                                                                                           |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <p>When the student complete studying this course, he should be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the importance of soil investigations and be able to plan a soil investigation.</li> <li>2. Estimate the bearing capacity and settlement of structures founded on soils.</li> <li>3. Calculate stresses in soils from external loads.</li> <li>4. Calculate one-dimensional consolidation settlement and time rate of settlement for foundations.</li> <li>5. Estimation of elastic and secondary settlement for foundations.</li> <li>6. Analyze and design shallow foundations.</li> </ol>  |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <ul style="list-style-type: none"> <li>• Chapter 1; Foundations: Their Importance and Purpose, Foundation Classification, Requirements of Foundations</li> <li>• Chapter 2; Soil Exploration; CHAPTER 2; Purpose of Subsurface Exploration, Planning for Subsurface Exploration, Methods of Soil Exploration, Soil Samples, Causes of Disturbance, Soil Samplers, Number of Borings, Depth of Borings, In-Situ (Field) Tests, Standard Penetration Test - ASTM-D1586, Cone Penetration Test (CPT) - ASTM-D5778, Vane Shear Test (VST) - ASTM D 2573M, Plate Loading Test (PLT) - ASTM-D1194, Soil Exploration Report</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>Chapter 3; Bearing Capacity of Shallow Foundations; Introduction, Bearing Capacity, Modes of Soil Failure, Terzaghi's Bearing Capacity Equation, Factor of Safety, Effect of Water Table on B.C., Meyerhof's Bearing Capacity Equation, General (Hansen's) Bearing Capacity Equation, Skempton's Method [<math>\phi = 0</math>], Footings with Eccentric Loadings, Footing on Layered Soils, Bearing Capacity of Footings Adjacent to a Slope, Bearing Capacity from Field Tests</li> <li>Chapter 4; Foundation Settlement; Introduction, Contact Pressure, Stresses in a Soil Mass, Consolidation Settlement, Secondary Settlement, Allowable Settlement</li> <li>Chapter 5; Spread Footing Design; Ultimate Strength Design Method (USD) (ACI: 318 - 19), Design of R.C. Spread Footings, Design of Plain Concrete Spread Footings, Rectangular Footings, Eccentrically Loaded Spread Footings</li> <li>Chapter 6; Combined Footing Design; Introduction, Rectangular Combined Footing, Trapezoidal Combined Footing, Strap (or Cantilever) Footing</li> <li>Chapter 7; Mat Foundation Design; Introduction, Types of Mat Foundations, Bearing Capacity of Mat Foundations, Mat Settlements, Design of Mat Foundations</li> </ul> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | I view teaching as a process of encouraging students to make connections between their own experience and to foster critical thinking skills and problem-solving. I am more concerned with the student's understanding of fundamental course concepts and their ability to apply them in new problem-solving situations. Exams should be |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>designed to bring together different concepts from individual examples and homework problems and combine them. My intent in developing exam questions is not to evaluate whether a student can solve a given problem, but to determine whether they understand and can apply the concepts required to solve this problem. After all, the chance that they will face the exact problem in practice is negligible, but the interaction of concepts to solve new problem is vital. As a result, students work is graded with respect to the process used in solving the problem rather than the final answer they will get.</p> <p>A professor should be sensitive to the background and preparation of the students. The way the students are treated has a great influence on the student's performance. I strive to demonstrate to each student my respect for them as individuals and for their contributions to the learning process. Thus, I try to learn every student's name and maintain a high level of classroom interaction. The class atmosphere is very relaxed, so students feel comfortable contributing and asking questions. To further facilitate students learning, I like to provide opportunities for reflection and feedback from students via after-class and office discussions, peer-to-peer feedback on assignments and learning activities and formal and informal evaluations. Students' responses and inputs are very helpful for improving my teaching skills.</p> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                |             |                |               |                           |
|---------------------------------------------------|----------------|-------------|----------------|---------------|---------------------------|
|                                                   |                | Time/Number | Weight (Marks) | Week Due      | Relevant Learning Outcome |
| Formative assessment                              | Quizzes        | 2           | 10% (10)       | 3 , 7         | All                       |
|                                                   | Assignments    | 2           | 10% (10)       | 2,4,6,8,10,12 | All                       |
|                                                   | Class activity | 0           | 10% (10)       |               |                           |
|                                                   | Report         | 0           | 10% (10)       |               |                           |
| Summative assessment                              | Midterm Exam   | 1 hr        | 10% (10)       | 10            | 1-5                       |
|                                                   | Final Exam     | 2hr         | 50% (50)       | 16            | All                       |

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

|               | Material Covered                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 1</b> | Chapter 1; Foundations: Their Importance and Purpose, Foundation Classification, Requirements of Foundations<br><br>Chapter 2; Soil Exploration; CHAPTER 2; Purpose of Subsurface Exploration, Planning for Subsurface Exploration, Methods of Soil Exploration, Soil Samples, Causes of Disturbance, Soil Samplers, Number of Borings, Depth of Borings,                                                                                                    |
| <b>Week 2</b> | Chapter 1; Foundations: Their Importance and Purpose, Foundation Classification, Requirements of Foundations<br><br>Chapter 2; Soil Exploration; CHAPTER 2; Purpose of Subsurface Exploration, Planning for Subsurface Exploration, Methods of Soil Exploration, Soil Samples, Causes of Disturbance, Soil Samplers, Number of Borings, Depth of Borings,                                                                                                    |
| <b>Week 3</b> | Chapter 1; Foundations: Their Importance and Purpose, Foundation Classification, Requirements of Foundations<br><br>Chapter 2; Soil Exploration; CHAPTER 2; Purpose of Subsurface Exploration, Planning for Subsurface Exploration, Methods of Soil Exploration, Soil Samples, Causes of Disturbance, Soil Samplers, Number of Borings, Depth of Borings,                                                                                                    |
| <b>Week 4</b> | In-Situ (Field) Tests, Standard Penetration Test - ASTM-D1586, Cone Penetration Test (CPT) - ASTM-D5778, Vane Shear Test (VST) - ASTM D 2573M, Plate Loading Test (PLT) - ASTM-D1194, Soil Exploration Report<br><br>Chapter 3; Bearing Capacity of Shallow Foundations; Introduction, Bearing Capacity, Modes of Soil Failure, Terzaghi's Bearing Capacity Equation, Factor of Safety, Effect of Water Table on B.C., Meyerhof's Bearing Capacity Equation, |
| <b>Week 5</b> | In-Situ (Field) Tests, Standard Penetration Test - ASTM-D1586, Cone Penetration Test (CPT) - ASTM-D5778, Vane Shear Test (VST) - ASTM D 2573M, Plate Loading Test (PLT) - ASTM-D1194, Soil Exploration Report<br><br>Chapter 3; Bearing Capacity of Shallow Foundations; Introduction, Bearing Capacity, Modes of Soil Failure, Terzaghi's Bearing Capacity Equation, Factor of Safety, Effect of Water Table on B.C., Meyerhof's Bearing Capacity Equation, |
| <b>Week 6</b> | General (Hansen's) Bearing Capacity Equation, Skempton's Method [ $\phi = 0$ ], Footings with Eccentric Loadings, Footing on Layered Soils, Bearing Capacity of Footings Adjacent to a Slope, Bearing Capacity from Field Tests                                                                                                                                                                                                                              |
| <b>Week 7</b> | General (Hansen's) Bearing Capacity Equation, Skempton's Method [ $\phi = 0$ ], Footings with Eccentric Loadings, Footing on Layered Soils, Bearing Capacity of Footings Adjacent to a Slope, Bearing Capacity from Field Tests                                                                                                                                                                                                                              |

|               |                                                                                            |
|---------------|--------------------------------------------------------------------------------------------|
| <b>Week 8</b> | Chapter 4; Foundation Settlement; Introduction, Contact Pressure, Stresses in a Soil Mass, |
| <b>Week 9</b> | Consolidation Settlement, Secondary Settlement, Allowable Settlement                       |

|                |                                                                                                                                                                                                                          |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 10</b> | Chapter 5; Spread Footing Design; Ultimate Strength Design Method (USD) (ACI: 318 - 19), Design of R.C. Spread Footings, Design of Plain Concrete Spread Footings,                                                       |
| <b>Week 11</b> | Chapter 5; Spread Footing Design; Ultimate Strength Design Method (USD) (ACI: 318 - 19), Design of R.C. Spread Footings, Design of Plain Concrete Spread Footings,                                                       |
| <b>Week 12</b> | Rectangular Footings, Eccentrically Loaded Spread Footings<br>Chapter 6; Combined Footing Design; Introduction, Rectangular Combined Footing,                                                                            |
| <b>Week 13</b> | Rectangular Footings, Eccentrically Loaded Spread Footings<br>Chapter 6; Combined Footing Design; Introduction, Rectangular Combined Footing,                                                                            |
| <b>Week 14</b> | Trapezoidal Combined Footing, Strap (or Cantilever) Footing<br>Chapter 7; Mat Foundation Design; Introduction, Types of Mat Foundations, Bearing Capacity of Mat Foundations, Mat Settlements, Design of Mat Foundations |
| <b>Week 15</b> | Trapezoidal Combined Footing, Strap (or Cantilever) Footing<br>Chapter 7; Mat Foundation Design; Introduction, Types of Mat Foundations, Bearing Capacity of Mat Foundations, Mat Settlements, Design of Mat Foundations |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                                                                                                                                            |

### Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                                              | Available in the Library? |
|--------------------------|---------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | Foundation Analysis and Design<br>By; Joseph E. Bowles                                            | Yes                       |
| <b>Recommended Texts</b> | Principles of Foundation Engineering – Ninth Edition<br>By; Braja M. Das and Nagaratnam Sivakugan | No                        |
| <b>Websites</b>          |                                                                                                   |                           |

### Grading Scheme

مخطط الدرجات

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

| Module Information                 |                           |                 |                                                                                                                                                                                                                               |                   |     |
|------------------------------------|---------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----|
| معلومات المادة الدراسية            |                           |                 |                                                                                                                                                                                                                               |                   |     |
| Module Title                       | Foundation engineering II |                 | Module Delivery                                                                                                                                                                                                               |                   |     |
| Module Type                        | Core                      |                 | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                   |     |
| Module Code                        | CE412                     |                 |                                                                                                                                                                                                                               |                   |     |
| ECTS Credits                       | 10                        |                 |                                                                                                                                                                                                                               |                   |     |
| SWL (hr/sem)                       | 250                       |                 |                                                                                                                                                                                                                               |                   |     |
| Module Level                       |                           | 4               | Semester of Delivery                                                                                                                                                                                                          |                   | 2   |
| Administering Department           |                           | Type Dept. Code | College                                                                                                                                                                                                                       | Type College Code |     |
| Module Leader                      | Dr. Jasim Al-Battat       |                 | e-mail                                                                                                                                                                                                                        |                   |     |
| Module Leader's Acad. Title        |                           |                 | Module Leader's Qualification                                                                                                                                                                                                 |                   |     |
| Module Tutor                       |                           |                 | e-mail                                                                                                                                                                                                                        |                   |     |
| Peer Reviewer Name                 |                           | Name            | e-mail                                                                                                                                                                                                                        | E-mail            |     |
| Scientific Committee Approval Date |                           | 1/09/2025       | Version Number                                                                                                                                                                                                                |                   | 1.0 |

| Relation with other Modules       |                 |          |  |
|-----------------------------------|-----------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                 |          |  |
| Prerequisite module               | Soil Mechanics  | Semester |  |
|                                   | Concrete Design |          |  |
| Co-requisites module              | None            | Semester |  |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>                      | <p>This course is intended to;</p> <ul style="list-style-type: none"> <li>• Determine the allowable axial load capacity of single piles and pile groups.</li> <li>• Determine the settlement of single pile and pile groups.</li> <li>• Understand and determine lateral earth pressure.</li> <li>• Understand the forces that lead to instability of earth retaining structures.</li> <li>• Determine the stability of earth retaining structures (retaining walls, sheet pile walls, braced excavation).</li> </ul> |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <p>When the student complete studying this course, he should be able to:</p> <ul style="list-style-type: none"> <li>• Determine the allowable axial load capacity of single pile and pile group.</li> <li>• Estimation of pile load in a pile group.</li> <li>• Determine the stability of earth structures.</li> </ul>                                                                                                                                                                                               |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <ul style="list-style-type: none"> <li>• Chapter 1; Pile Foundations: Single Pile Analysis; Introduction, Classification of Piles, Static Pile Capacity, Point Bearing Capacity, Point Bearing from Field Tests, SPT, CPT, Skin Friction Capacity, Pile Loading Test-Axial Compression (ASTM-D1143), Pile Capacity – Dynamic Analysis</li> </ul>                                                                                                                                                                      |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Chapter 2; Pile Foundations: Groups; Introduction, The Carrying Capacity of Pile Groups, Efficiency of Pile Groups, Settlement of Pile Groups, Pile Caps, Negative Skin Friction</li> <li>• Chapter 3; Lateral Earth Pressure; Introduction, Coulomb Earth Pressure Theory, Rankine Earth Pressures</li> <li>• Chapter 4; Retaining Walls; Introduction, Stability of Retaining Walls, Base Key.</li> <li>• Chapter 5; Sheet Pile Walls; Introduction, Types of sheetpiling, Safety Factor, Cantilever Sheetpiling, Anchored Sheetpiling: Free-Earth Support, Capacity of Deadman, Location of Deadman.</li> </ul> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                          |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | I view teaching as a process of encouraging students to make connections between their own experience and to foster critical thinking skills and problem-solving. I am more concerned with the student's understanding of fundamental course concepts and their ability to apply them in new problem-solving situations. Exams should be |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>designed to bring together different concepts from individual examples and homework problems and combine them. My intent in developing exam questions is not to evaluate whether a student can solve a given problem, but to determine whether they understand and can apply the concepts required to solve this problem. After all, the chance that they will face the exact problem in practice is negligible, but the interaction of concepts to solve new problem is vital. As a result, students work is graded with respect to the process used in solving the problem rather than the final answer they will get.</p> <p>A professor should be sensitive to the background and preparation of the students. The way the students are treated has a great influence on the student's performance. I strive to demonstrate to each student my respect for them as individuals and for their contributions to the learning process. Thus, I try to learn every student's name and maintain a high level of classroom interaction. The class atmosphere is very relaxed, so students feel comfortable contributing and asking questions. To further facilitate students learning, I like to provide opportunities for reflection and feedback from students via after-class and office discussions, peer-to-peer feedback on assignments and learning activities and formal and informal evaluations. Students' responses and inputs are very helpful for improving my teaching skills.</p> |
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## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

|                                                                                |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

## Module Evaluation

تقييم المادة الدراسية

|  | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|--|-------------|----------------|----------|---------------------------|
|--|-------------|----------------|----------|---------------------------|

|                             |                       |      |                  |               |     |
|-----------------------------|-----------------------|------|------------------|---------------|-----|
| <b>Formative assessment</b> | <b>Quizzes</b>        | 2    | 10% (10)         | 3 , 7         | All |
|                             | <b>Assignments</b>    | 2    | 10% (10)         | 2,4,6,8,10,12 | All |
|                             | <b>Class activity</b> | 1    | 10% (10)         |               |     |
|                             | <b>Report</b>         | 1    | 10% (10)         |               |     |
| <b>Summative assessment</b> | <b>Midterm Exam</b>   | 1 hr | 10% (10)         | 10            | 1-5 |
|                             | <b>Final Exam</b>     | 2hr  | 50% (50)         | 16            | All |
| <b>Total assessment</b>     |                       |      | 100% (100 Marks) |               |     |

### Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

|                | Material Covered                                                                                                                                                                  |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 1</b>  | Chapter 1; Pile Foundations: Single Pile Analysis; Introduction, Classification of Piles, Static Pile Capacity, Point Bearing Capacity, Point Bearing from Field Tests, SPT, CPT, |
| <b>Week 2</b>  | Pile Foundations: Single Pile Analysis; Introduction, Classification of Piles, Static Pile Capacity, Point Bearing Capacity, Point Bearing from Field Tests, SPT, CPT,            |
| <b>Week 3</b>  | Pile Foundations: Single Pile Analysis; Introduction, Classification of Piles, Static Pile Capacity, Point Bearing Capacity, Point Bearing from Field Tests, SPT, CPT,            |
| <b>Week 4</b>  | Skin Friction Capacity, Pile Loading Test-Axial Compression (ASTM-D1143), Pile Capacity – Dynamic Analysis                                                                        |
| <b>Week 5</b>  | Skin Friction Capacity, Pile Loading Test-Axial Compression (ASTM-D1143), Pile Capacity – Dynamic Analysis                                                                        |
| <b>Week 6</b>  | Pile Foundations: Groups; Introduction, The Carrying Capacity of Pile Groups, Efficiency of Pile Groups, Settlement of Pile Groups, Pile Caps, Negative Skin Friction             |
| <b>Week 7</b>  | Pile Foundations: Groups; Introduction, The Carrying Capacity of Pile Groups, Efficiency of Pile Groups, Settlement of Pile Groups, Pile Caps, Negative Skin Friction             |
| <b>Week 8</b>  | Pile Foundations: Groups; Introduction, The Carrying Capacity of Pile Groups, Efficiency of Pile Groups, Settlement of Pile Groups, Pile Caps, Negative Skin Friction             |
| <b>Week 9</b>  | Lateral Earth Pressure; Introduction, Coulomb Earth Pressure Theory, Rankine Earth Pressures                                                                                      |
| <b>Week 10</b> | Lateral Earth Pressure; Introduction, Coulomb Earth Pressure Theory, Rankine Earth Pressures                                                                                      |
| <b>Week 11</b> | Retaining Walls; Introduction, Stability of Retaining Walls, Base Key.                                                                                                            |

|                |                                                                                              |
|----------------|----------------------------------------------------------------------------------------------|
| <b>Week 12</b> | Sheet Pile Walls; Introduction, Types of sheetpiling, Safety Factor, Cantilever Sheetpiling, |
| <b>Week 13</b> | Sheet Pile Walls; Introduction, Types of sheetpiling, Safety Factor, Cantilever Sheetpiling, |
| <b>Week 14</b> | Anchored Sheetpiling: Free-Earth Support, Capacity of Deadman, Location of Deadman.          |
| <b>Week 15</b> | Anchored Sheetpiling: Free-Earth Support, Capacity of Deadman, Location of Deadman.          |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                |

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

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                                                                                   |                           |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------|
|                                                                 | Text                                                                                              | Available in the Library? |
| <b>Required Texts</b>                                           | Foundation Analysis and Design<br>By; Joseph E. Bowles                                            | Yes                       |
| <b>Recommended Texts</b>                                        | Principles of Foundation Engineering – Ninth Edition<br>By; Braja M. Das and Nagaratnam Sivakugan | No                        |
| <b>Websites</b>                                                 |                                                                                                   |                           |

## Grading Scheme

مخطط الدرجات

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

| Module Information                 |                               |                      |                                                                                                                                                                                                                               |
|------------------------------------|-------------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                               |                      |                                                                                                                                                                                                                               |
| Module Title                       | <b>Prestress Concrete</b>     |                      | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | Core                          |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>CE411</b>                  |                      |                                                                                                                                                                                                                               |
| ECTS Credits                       | 8                             |                      |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | <b>200</b>                    |                      |                                                                                                                                                                                                                               |
| Module Level                       | 4                             | Semester of Delivery | 2                                                                                                                                                                                                                             |
| Administering Department           | Type Dept. Code               | College              | Type College Code                                                                                                                                                                                                             |
| Module Leader                      | e-mail                        |                      |                                                                                                                                                                                                                               |
| Module Leader's Acad. Title        | Module Leader's Qualification |                      |                                                                                                                                                                                                                               |
| Module Tutor                       | e-mail                        |                      |                                                                                                                                                                                                                               |
| Peer Reviewer Name                 | Name                          | e-mail               | E-mail                                                                                                                                                                                                                        |
| Scientific Committee Approval Date | 1\9\2025                      | Version Number       | 1.0                                                                                                                                                                                                                           |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | 1. To develop an understanding of the basic principles of structural analysis and be able to explain them.<br>2. To determine and analyze models of applied loads on structures.<br>3. To develop and utilize influence lines of structures.<br>4. To utilize various methods of analysis of beams, trusses, and frames to determine the response of both determinate and indeterminate structures. |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | 5. To understand the role of structural analysis within the context of engineering design and decision making.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | 1. Ability to apply knowledge of basic mathematics through differential equations, science, and engineering to solving engineering problems.<br>2. Ability to formulate and solve civil engineering problems.<br>3. Understanding of professional and ethical responsibility.<br>4. Recognition of the need for, and an ability to engage in, life-long learning.<br>5. Ability to use modern tools, techniques, and computation methods necessary for civil engineering practice.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | Part I: Statically Determinate Structures<br>Types of structural elements, Types of structures, Types of loads, Types of supports, Equations of equilibrium, Equations of condition, Determinancy and stability.<br>Internal loadings developed in structural members, sign convention, Shear force and bending moment diagrams for a beam, Relationships between load, shear force and bending moment, Moment diagrams by method of superposition, Shear and moment diagrams for a frame.<br>Determinancy and stability of trusses, The method of joints, The method of sections.<br>Influence lines for statically determinate structures, Influence lines for beams, Relationships of influence lines and structural loading, Influence lines for trusses, Moving loads on beams, Absolute maximum moment in a beam.<br>Approximate analysis of statically indeterminate structures, Indeterminate trusses, Vertical loads on building frames, Lateral loads on building frames: portal method.<br>Deflection of a beam, Significance of beam deflections, Double integration method, Singularity function method, Moment-area method.<br>Part II: Statically Indeterminate Structures<br>3<br>Force methods, Method of consistent deformations, Basic procedure, Primary structure, Redundant reaction components.<br>Displacement methods, The slope-deflection method, Derivation of the slope- deflection equations, Application of the slope-deflection method to the analysis of statically indeterminate beams, Analysis of rigid frames without joint translation.<br>The moment distribution method, General description of the moment distribution method, Distribution factor, Procedure, Modified stiffness factor for hinged far end, Support settlement, Application of moment distribution to frames without sidesway.<br>Energy methods, Strain energy in an elastic system: axial loading, flexural loading, Castigliano's theorem method, Joint displacement in trusses, Application of Castigliano's theorem to statically indeterminate structures: beams, frames. |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

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

| Delivery Plan (Weekly Syllabus) |                                                                              |
|---------------------------------|------------------------------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                                              |
|                                 | Material Covered                                                             |
| Week 1                          | Introduction                                                                 |
| Week 2                          | Yield line analysis for slabs                                                |
| Week 3                          | One-Way Joist Slab (Ribbed Slab)                                             |
| Week 4                          | Flat slab                                                                    |
| Week 5                          | Waffle slab                                                                  |
| Week 6                          | Precast slab                                                                 |
| Week 7                          | Slabs on grade                                                               |
| Week 8                          | Composite slab                                                               |
| Week 9                          | Prestress concrete                                                           |
| Week 10                         | Analysis of flexural member of prestress concrete beams                      |
| Week 11                         | Analysis of flexural member of prestress concrete beams                      |
| Week 12                         | Design of flexural member of prestress concrete beams                        |
| Week 13                         | Design of flexural member of prestress concrete beams                        |
| Week 14                         | development length and anchorage zone design                                 |
| Week 15                         | Deflection and crack control for flexural member of prestress concrete beams |
| Week 16                         | Preparatory week before the final Exam                                       |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                                                                                     | Available in the Library? |
|-------------------|------------------------------------------------------------------------------------------|---------------------------|
| Required Texts    | "Elementary Theory of Structures", Yan-yu Hsieh, Prentice-Hall, 1982.                    | Yes                       |
| Recommended Texts | "Structural Analysis", Russel C. Hibbeler, 9 <sup>th</sup> ed., Pearson Education, 2014. | No                        |
| Websites          |                                                                                          |                           |

### Grading Scheme

مخطط الدرجات

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

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

| Module Information                 |                 |                      |                                                                                                                                                                                                                               |   |
|------------------------------------|-----------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| معلومات المادة الدراسية            |                 |                      |                                                                                                                                                                                                                               |   |
| Module Title                       | Steel 1         |                      | Module Delivery                                                                                                                                                                                                               |   |
| Module Type                        | Core            |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |   |
| Module Code                        | CE413           |                      |                                                                                                                                                                                                                               |   |
| ECTS Credits                       | 6               |                      |                                                                                                                                                                                                                               |   |
| SWL (hr/sem)                       | 150             |                      |                                                                                                                                                                                                                               |   |
| Module Level                       | 4               | Semester of Delivery |                                                                                                                                                                                                                               | 2 |
| Administering Department           | Type Dept. Code | College              | Type College Code                                                                                                                                                                                                             |   |
| Module Leader                      |                 |                      | e-mail                                                                                                                                                                                                                        |   |
| Module Leader's Acad. Title        |                 |                      | Module Leader's Qualification                                                                                                                                                                                                 |   |
| Module Tutor                       |                 |                      | e-mail                                                                                                                                                                                                                        |   |
| Peer Reviewer Name                 | Name            | e-mail               | E-mail                                                                                                                                                                                                                        |   |
| Scientific Committee Approval Date | 1/09/2025       | Version Number       | 1.0                                                                                                                                                                                                                           |   |

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

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | 1- Understanding steel as a structural material, and get knowledge of its mechanical properties.<br>2- Knowledge of design codes and standards.<br>3- Learning to identify and evaluate the various loads.<br>4- Understanding the analysis and design of tension members in steel structures.<br>5- Studying the analysis and design of compression members.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | A- Cognitive objectives<br>A1- Understanding steel as a structural material, and get knowledge of its mechanical properties.<br>A2- - Knowledge of design codes and standards<br>A3- Understanding the analysis and design of tension and compression members in steel structures.<br><br>B- Skill objectives specific to the course.<br>B1- provision of necessary skills to deal with steel structures.<br>B2- Ability to analyze tension and compression members.<br>B3- Knowledge of the procedures involved in designing tension and compression members.<br><br>C. Thinking Skills<br>C1- Analytical thinking: analyze steel structural members under different loading conditions.<br>C2- Design thinking: develop efficient and economical steel structural designs that satisfy strength, and serviceability requirements.<br>C3- Decision-making skills: choose of suitable steel grade and sections based on engineering judgment and standards. |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | <ul style="list-style-type: none"> <li>The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

|  |                                                                                                                                                                                                              |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>Direct questions in a manner (how and why) for the subject during the lecture.</li> <li>short exams during the theoretical lecture.</li> <li>Midterm exam.</li> </ul> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                          |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | I view teaching as a process of encouraging students to make connections between their own experience and to foster critical thinking skills and problem-solving. I am more concerned with the student's understanding of fundamental course concepts and their ability to apply them in new problem-solving situations. Exams should be |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>designed to bring together different concepts from individual examples and homework problems and combine them. My intent in developing exam questions is not to evaluate whether a student can solve a given problem, but to determine whether they understand and can apply the concepts required to solve this problem. After all, the chance that they will face the exact problem in practice is negligible, but the interaction of concepts to solve new problem is vital. As a result, students work is graded with respect to the process used in solving the problem rather than the final answer they will get.</p> <p>A professor should be sensitive to the background and preparation of the students. The way the students are treated has a great influence on the student's performance. I strive to demonstrate to each student my respect for them as individuals and for their contributions to the learning process. Thus, I try to learn every student's name and maintain a high level of classroom interaction. The class atmosphere is very relaxed, so students feel comfortable contributing and asking questions. To further facilitate students learning, I like to provide opportunities for reflection and feedback from students via after-class and office discussions, peer-to-peer feedback on assignments and learning activities and formal and informal evaluations. Students' responses and inputs are very helpful for improving my teaching skills.</p> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

|                                                                                |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

## Module Evaluation

تقييم المادة الدراسية

|         | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---------|-------------|----------------|----------|---------------------------|
| Quizzes | 2           | 10% (10)       | 3 , 7    | All                       |

|                             |                       |      |                  |               |     |
|-----------------------------|-----------------------|------|------------------|---------------|-----|
| <b>Formative assessment</b> | <b>Assignments</b>    | 2    | 10% (10)         | 2,4,6,8,10,12 | All |
|                             | <b>Class activity</b> | 1    | 10% (10)         |               |     |
|                             | <b>Report</b>         | 1    | 10% (10)         |               |     |
| <b>Summative assessment</b> | <b>Midterm Exam</b>   | 1 hr | 10% (10)         | 10            | 1-5 |
|                             | <b>Final Exam</b>     | 2hr  | 50% (50)         | 16            | All |
| <b>Total assessment</b>     |                       |      | 100% (100 Marks) |               |     |

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

|                | Material Covered                                                                                                                                            |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 1</b>  | Introduction                                                                                                                                                |
| <b>Week 2</b>  | Advantages and disadvantages of steel as a structural material,                                                                                             |
| <b>Week 3</b>  | cold-formed steel shapes, steel grades, stress-strain relationships for structural steel,                                                                   |
| <b>Week 4</b>  | Specifications, loads, design methods ( load and resistance factor design, LRFD, and the allowable strength design, ASD ),                                  |
| <b>Week 5</b>  | nominal strength, load combinations for LRFD and ASD methods, description of the AISC manual                                                                |
| <b>Week 6</b>  | Tension members: Introduction, tensile strength of tension members, net area                                                                                |
| <b>Week 7</b>  | effective area, connecting elements for tension members.                                                                                                    |
| <b>Week 8</b>  | block shear                                                                                                                                                 |
| <b>Week 9</b>  | AISC requirements, maximum slenderness ratio, design tables.                                                                                                |
| <b>Week 10</b> | design of tension members, selection of sections, design to LRFD,                                                                                           |
| <b>Week 11</b> | design to ASD, design tables, built- up tension members.                                                                                                    |
| <b>Week 12</b> | <b>Analysis of axially loaded compression members:</b> Modes of failure, sections used for columns, the Euler formula, effective lengths of columns         |
| <b>Week 13</b> | stiffened and unstiffened elements, long, short and intermediate columns                                                                                    |
| <b>Week 14</b> | columns with different unsupported lengths, built-up columns, design of built-up columns with lacing, columns within rigid frames and the alignment charts. |
| <b>Week 15</b> | columns with different unsupported lengths, built-up columns, design of built-up columns with lacing, columns within rigid frames and the alignment charts. |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                                                                               |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                                                                                                                                 | Available in the Library? |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Required Texts    | 1- AISC Steel Construction Manual, Fifteenth edition-2017.<br>2- Structural Steel Design.by McCormac and Csernak, 6th edition, 2018. | Yes                       |
| Recommended Texts |                                                                                                                                      | No                        |
| Websites          |                                                                                                                                      |                           |

### Grading Scheme

مخطط الدرجات

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

| Module Information                 |                 |                      |                                                                                                                                                                                                                               |   |
|------------------------------------|-----------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| معلومات المادة الدراسية            |                 |                      |                                                                                                                                                                                                                               |   |
| Module Title                       | Steel 2         |                      | Module Delivery                                                                                                                                                                                                               |   |
| Module Type                        | Core            |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |   |
| Module Code                        | CE413           |                      |                                                                                                                                                                                                                               |   |
| ECTS Credits                       | 6               |                      |                                                                                                                                                                                                                               |   |
| SWL (hr/sem)                       | 150             |                      |                                                                                                                                                                                                                               |   |
| Module Level                       | 4               | Semester of Delivery |                                                                                                                                                                                                                               | 2 |
| Administering Department           | Type Dept. Code | College              | Type College Code                                                                                                                                                                                                             |   |
| Module Leader                      |                 |                      | e-mail                                                                                                                                                                                                                        |   |
| Module Leader's Acad. Title        |                 |                      | Module Leader's Qualification                                                                                                                                                                                                 |   |
| Module Tutor                       |                 |                      | e-mail                                                                                                                                                                                                                        |   |
| Peer Reviewer Name                 | Name            | e-mail               | E-mail                                                                                                                                                                                                                        |   |
| Scientific Committee Approval Date | 1/09/2025       | Version Number       | 1.0                                                                                                                                                                                                                           |   |

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

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | 1- Understanding the behaviour of beams in steel structures.<br>2- Learning the analysis and design of beams.<br>3- Studying the analysis and design of beam-column members.<br>4- Investigating the behaviour and design of bolted connection under the effect of concentric and eccentric loading.<br>5- Understanding the behaviour and design of welded connection.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | A- Cognitive objectives<br>A1- Understanding steel as a structural material, and get knowledge of its mechanical properties.<br>A2- - Knowledge of design codes and standards<br>A3- Understanding the analysis and design of tension and compression members in steel structures.<br><br>B- Skill objectives specific to the course.<br>B1- provision of necessary skills to deal with steel structures.<br>B2- Ability to analyze tension and compression members.<br>B3- Knowledge of the procedures involved in designing tension and compression members.<br><br>C. Thinking Skills<br>C1- Analytical thinking: analyze steel structural members under different loading conditions.<br>C2- Design thinking: develop efficient and economical steel structural designs that satisfy strength, and serviceability requirements.<br>C3- Decision-making skills: choose of suitable steel grade and sections based on engineering judgment and standards. |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | <ul style="list-style-type: none"> <li>The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the curriculum of the subject.</li> <li>The theoretical presentation method using the (data show) device and depending on the method (how and why) of the subject and according to the subject curriculum.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                  | <ul style="list-style-type: none"> <li>Direct questions in a manner (how and why) for the subject during the lecture.</li> <li>short exams during the theoretical lecture.</li> <li>Midterm exam.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                          |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | I view teaching as a process of encouraging students to make connections between their own experience and to foster critical thinking skills and problem-solving. I am more concerned with the student's understanding of fundamental course concepts and their ability to apply them in new problem-solving situations. Exams should be |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>designed to bring together different concepts from individual examples and homework problems and combine them. My intent in developing exam questions is not to evaluate whether a student can solve a given problem, but to determine whether they understand and can apply the concepts required to solve this problem. After all, the chance that they will face the exact problem in practice is negligible, but the interaction of concepts to solve new problem is vital. As a result, students work is graded with respect to the process used in solving the problem rather than the final answer they will get.</p> <p>A professor should be sensitive to the background and preparation of the students. The way the students are treated has a great influence on the student's performance. I strive to demonstrate to each student my respect for them as individuals and for their contributions to the learning process. Thus, I try to learn every student's name and maintain a high level of classroom interaction. The class atmosphere is very relaxed, so students feel comfortable contributing and asking questions. To further facilitate students learning, I like to provide opportunities for reflection and feedback from students via after-class and office discussions, peer-to-peer feedback on assignments and learning activities and formal and informal evaluations. Students' responses and inputs are very helpful for improving my teaching skills.</p> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

|                                                                                |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 90  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 60  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 150 |                                                                           |     |

## Module Evaluation

تقييم المادة الدراسية

|         | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---------|-------------|----------------|----------|---------------------------|
| Quizzes | 2           | 10% (10)       | 3 , 7    | All                       |

|                             |                       |      |                  |               |     |
|-----------------------------|-----------------------|------|------------------|---------------|-----|
| <b>Formative assessment</b> | <b>Assignments</b>    | 2    | 10% (10)         | 2,4,6,8,10,12 | All |
|                             | <b>Class activity</b> | 1    | 10% (10)         |               |     |
|                             | <b>Report</b>         | 1    | 10% (10)         |               |     |
| <b>Summative assessment</b> | <b>Midterm Exam</b>   | 1 hr | 10% (10)         | 10            | 1-5 |
|                             | <b>Final Exam</b>     | 2hr  | 50% (50)         | 16            | All |
| <b>Total assessment</b>     |                       |      | 100% (100 Marks) |               |     |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                   | <b>Material Covered</b>                                                                                                                                                                                                                             |
| <b>Week 1</b>                                                     | Design of Beams for Moments and shear: Introduction, Plastic behavior (zone1).                                                                                                                                                                      |
| <b>Week 2</b>                                                     | Plastic behavior (zone1). design of beams - zone1<br><br>(full plastic moment), lateral supports of beams,                                                                                                                                          |
| <b>Week 3</b>                                                     | inelastic buckling (zone 2), bending<br>coefficients, moment capacities (zone 2), design of beams – zone 3,                                                                                                                                         |
| <b>Week 4</b>                                                     | elastic buckling,( zone 3), AISC beam design charts, noncompact sections                                                                                                                                                                            |
| <b>Week 5</b>                                                     | Design for shear, unsymmetrical bending, and design of purlins.                                                                                                                                                                                     |
| <b>Week 6</b>                                                     | Bending and Axial Compression (Beam-Columns): Bending and axial compression, Beam – Columns, first order and second order moments, analysis                                                                                                         |
| <b>Week 7</b>                                                     | effective length, approximate second order analysis method.                                                                                                                                                                                         |
| <b>Week 8</b>                                                     | magnification factors, moment modification factors.                                                                                                                                                                                                 |
| <b>Week 9</b>                                                     | design of beam-columns in braced frames                                                                                                                                                                                                             |
| <b>Week 10</b>                                                    | Bolted Connections: Types of bolts, high - strength bolts, snug - tight joints, pretension joints, slip - critical<br><br>joints, fully pretensioning methods, sizes of bolt holes, load transfer, lap joint, butt joint, failure of bolted joints, |
| <b>Week 11</b>                                                    | bearing type connections. shear strength and bearing strength for bearing type connections (load pass through center of gravity of connection).                                                                                                     |
| <b>Week 12</b>                                                    | Eccentrically Loaded Bolted Connections: Bolts subjected to eccentric shear, Elastic analysis method, reduced eccentricity method, instantaneous center of rotation method.                                                                         |
| <b>Week 13</b>                                                    | AISC - Part7 Tables, bearing - type connections subjected to shear and tension.                                                                                                                                                                     |
| <b>Week 14</b>                                                    | Welded Connections: Welding advantages, types of welding, classification of welds, type of weld, type of<br><br>joints, fillet welds, plug and slot welds, welding symbols, strength of welds                                                       |

|                |                                                                                                                                                                                                                                              |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 15</b> | Bolted Connections: Types of bolts, high - strength bolts, snug - tight joints, pretension joints, slip - critical joints, fully pretensioning methods, sizes of bolt holes, load transfer, lap joint, butt joint, failure of bolted joints, |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                                                                                                                                                                |

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

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                                                                                                                      |                                  |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                                                 | <b>Text</b>                                                                                                                          | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                           | 1- AISC Steel Construction Manual, Fifteenth edition-2017.<br>2- Structural Steel Design.by McCormac and Csernak, 6th edition, 2018. | Yes                              |
| <b>Recommended Texts</b>                                        |                                                                                                                                      | No                               |
| <b>Websites</b>                                                 |                                                                                                                                      |                                  |

| Module Information                 |                            |                               |                                                                                                                                                                                                                               |
|------------------------------------|----------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                            |                               |                                                                                                                                                                                                                               |
| Module Title                       | <b>Construction Method</b> |                               | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | Core                       |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>CE417</b>               |                               |                                                                                                                                                                                                                               |
| ECTS Credits                       | 4                          |                               |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | <b>100</b>                 |                               |                                                                                                                                                                                                                               |
| Module Level                       | 4                          | Semester of Delivery          | 2                                                                                                                                                                                                                             |
| Administering Department           | Type Dept. Code            | College                       | Type College Code                                                                                                                                                                                                             |
| Module Leader                      | e-mail                     |                               |                                                                                                                                                                                                                               |
| Module Leader's Acad. Title        |                            | Module Leader's Qualification |                                                                                                                                                                                                                               |
| Module Tutor                       | e-mail                     |                               |                                                                                                                                                                                                                               |
| Peer Reviewer Name                 | Name                       | e-mail                        | E-mail                                                                                                                                                                                                                        |
| Scientific Committee Approval Date | 1\9\2025                   | Version Number                | 1.0                                                                                                                                                                                                                           |

| Relation with other Modules       |                                      |          |  |
|-----------------------------------|--------------------------------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                                      |          |  |
| Prerequisite module               | Concrete design, Mathematics, Survey | Semester |  |
| Co-requisites module              | None                                 | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | Introduction to the various construction techniques, practices, and equipment needed for different types of construction activities. It also leads the student through the steps of creating a detailed building estimate utilizing construction documents. Direct costs are generated by performing quantity take-offs and pricing with historical data, labor, and productivity rates. Students analyze subcontractor bids, generate indirect costs, and apply project margins to complete a building estimate. |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | When the student complete studying this course, he should be able to:<br>7. Determine the allowable axial load capacity of single pile and pile group.<br>8. Estimation of pile load in a pile group.<br>9. Determine the stability of earth structures.                                                                                                                                                               |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | Understanding of general concepts of methods of construction and/ or project management,<br>• Ability in:<br>1. Planning and scheduling of construction projects,<br>2. Estimating construction projects.<br>3. Participating in taking-over, final measurement, and acceptance of construction.<br>4. projects, selection of construction equipment properly.<br>5. Measuring of construction equipment and planning, |

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | Different forms of teaching will be used to reach the objectives of the course. Notes are to be written on the whiteboard, especially design equations, head titles, definitions and summary of conclusions, classification of materials, and any other illustration, there will be classroom discussions and the lecture will give enough background to solve examples. Power points presentations will be used when required, besides worksheets will be designed to let the chance for practicing. Students should read the lecture notes regularly and participate the classroom discussions. |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

#### الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

|                                                                                |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

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

| Delivery Plan (Weekly Syllabus) |                                                      |
|---------------------------------|------------------------------------------------------|
| المناهج الاسبوعي النظري         |                                                      |
|                                 | Material Covered                                     |
| Week 1                          | Construction equipment and engineering fundamentals. |
| Week 2                          | Soil stabilization and compaction, Tractors          |
| Week 3                          | Bulldozers, scrapers.                                |
| Week 4                          | Excavating equipment                                 |
| Week 5                          | Trucks                                               |
| Week 6                          | The form works for concrete structures               |
| Week 7                          | Estimation fundamentals                              |
| Week 8                          | Buildings estimation material                        |
| Week 9                          | Buildings estimation material                        |

|                |                                               |
|----------------|-----------------------------------------------|
| <b>Week 10</b> | Buildings estimation material                 |
| <b>Week 11</b> | Earthwork estimation                          |
| <b>Week 12</b> | Earthwork estimation                          |
| <b>Week 13</b> | Cost estimation                               |
| <b>Week 14</b> | Contracts and technical specifications        |
| <b>Week 15</b> | Contracts and technical specifications        |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b> |

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

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                                                                                                                                                                                                                                                                                         |                           |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                                 | Text                                                                                                                                                                                                                                                                                                    | Available in the Library? |
| <b>Required Texts</b>                                           | 1. Fundamentals of Behavioral Statistics, 1988 Peurifoy Robert L, and Ledbetter, William B. "Construction Planning, Equipment & Methods" 4th Edition, McGraw-Hill, 1985.<br>2. Nunnally, S. W. "Construction Methods and Management", 7th Edition, Upper Saddle River, New Jersey: Prentice Hall, 2007. | Yes                       |

|                          |                                                                                                                                                          |    |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|                          | 3. Dutta, B. N. “ Estimating and Costing in Civil Engineering-Theory and Practice”, 24th Edition, USB Publishers’ Distributors<br>Ltd., New Delhi, 1999. |    |
| <b>Recommended Texts</b> |                                                                                                                                                          | No |
| <b>Websites</b>          |                                                                                                                                                          |    |

| <b>Grading Scheme</b><br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                |                         |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade                   | التقدير             | Marks (%) | Definition                            |
| <b>Success Group<br/>(50 - 100)</b>                                                                                                                                                                                                                                                                                                                                                  | <b>A</b> - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>B</b> - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>C</b> - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>D</b> - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>E</b> - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| <b>Fail Group<br/>(0 – 49)</b>                                                                                                                                                                                                                                                                                                                                                       | <b>FX</b> – Fail        | راسب (قيد المعالجة) | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>F</b> – Fail         | راسب                | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                         |                     |           |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                         |                     |           |                                       |

| Module Information                 |                      |                               |                                                                                                                                                                                                                                          |                   |   |
|------------------------------------|----------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---|
| معلومات المادة الدراسية            |                      |                               |                                                                                                                                                                                                                                          |                   |   |
| Module Title                       | Sanitary engineering |                               | Module Delivery                                                                                                                                                                                                                          |                   |   |
| Module Type                        | Core                 |                               | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                   |   |
| Module Code                        | CE416                |                               |                                                                                                                                                                                                                                          |                   |   |
| ECTS Credits                       | 8                    |                               |                                                                                                                                                                                                                                          |                   |   |
| SWL (hr/sem)                       | 200                  |                               |                                                                                                                                                                                                                                          |                   |   |
| Module Level                       |                      | 4                             | Semester of Delivery                                                                                                                                                                                                                     |                   | 2 |
| Administering Department           |                      | Type Dept. Code               | College                                                                                                                                                                                                                                  | Type College Code |   |
| Module Leader                      |                      | e-mail                        |                                                                                                                                                                                                                                          |                   |   |
| Module Leader's Acad. Title        |                      | Module Leader's Qualification |                                                                                                                                                                                                                                          |                   |   |
| Module Tutor                       |                      | e-mail                        |                                                                                                                                                                                                                                          |                   |   |
| Peer Reviewer Name                 |                      | Name                          | e-mail                                                                                                                                                                                                                                   | E-mail            |   |
| Scientific Committee Approval Date |                      | 1\9\2025                      | Version Number                                                                                                                                                                                                                           | 1.0               |   |

| Relation with other Modules       |                                      |          |  |
|-----------------------------------|--------------------------------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                                      |          |  |
| Prerequisite module               | Concrete design, Mathematics, Survey | Semester |  |
| Co-requisites module              | None                                 | Semester |  |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | <p>The aim of this module is to learn the students how to;</p> <ol style="list-style-type: none"> <li>1. compute the quantity of potable water,</li> <li>2. recognize the materials used in piping works,</li> <li>3. design water pumping stations,</li> <li>4. design water treatment systems,</li> <li>5. assess the environmental impact of untreated sewage discharge,</li> <li>6. compute the quantity of sanitary sewage,</li> <li>7. compute the quantity of storm water,</li> <li>8. design sewer systems,</li> <li>9. design sewage treatment systems, and</li> <li>10. design sludge treatment systems.</li> </ol>                                                             |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <p>On successful completion of this module, students will be able to;</p> <ol style="list-style-type: none"> <li>1. compute the quantity of potable water for a specific city,</li> <li>2. select the appropriate piping material,</li> <li>3. analyze and design water networks,</li> <li>4. design water pumping stations,</li> <li>5. design water treatment systems.</li> <li>6. compute the quantity of sanitary sewage for a specific city,</li> <li>7. compute the quantity of storm water,</li> <li>8. design sanitary sewer system,</li> <li>9. design storm sewer system,</li> <li>10. design sewage treatment systems.</li> <li>11. design sludge treatment systems</li> </ol> |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | <p>Water use, variations of water consumption rates, design period, population estimate, fire demand, ductile iron pipes, PVC pipes, steel pipes, concrete pipes, HDPE pipes, GRP pipes, flow in water pipelines, analysis of water networks using Hardy-Cross method, design of water networks, types of water pumping stations, types of pumps, power of pumping, system head curve, pump characteristics curves, pumps connection, pumps selection, water treatment, rapid mix unit, coagulation process, flocculation unit, sedimentation unit, filtration unit, disinfection unit <b>(56 hours)</b>.</p>                                                                             |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                      |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <p>This module will be adopted through different strategies like; in-class lectures and interactive tutorials, field data collection for nearby water and sewage projects, in- lab experiments, and photo and video presentations for existing water and sewage treatment equipment and systems.</p> |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

| Module Evaluation           |                       |             |                  |               |                           |
|-----------------------------|-----------------------|-------------|------------------|---------------|---------------------------|
| تقييم المادة الدراسية       |                       |             |                  |               |                           |
|                             |                       | Time/Number | Weight (Marks)   | Week Due      | Relevant Learning Outcome |
| <b>Formative assessment</b> | <b>Quizzes</b>        | 2           | 10% (10)         | 3 , 7         | All                       |
|                             | <b>Assignments</b>    | 2           | 10% (10)         | 2,4,6,8,10,12 | All                       |
|                             | <b>Class activity</b> | 1           | 10% (10)         |               |                           |
|                             | <b>Report</b>         | 1           | 10% (10)         |               |                           |
| <b>Summative assessment</b> | <b>Midterm Exam</b>   | 1 hr        | 10% (10)         | 10            | 1-5                       |
|                             | <b>Final Exam</b>     | 2hr         | 50% (50)         | 16            | All                       |
| <b>Total assessment</b>     |                       |             | 100% (100 Marks) |               |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                                                                                                                                    |
|                                 | Material Covered                                                                                                                                                   |
| <b>Week 1</b>                   | Quantity of water: Water use; variations in rates of water consumption; design period; population estimate; fire demand.                                           |
| <b>Week 2</b>                   | Piping materials: Ductile iron piping works; PVC piping works; steel piping works; concrete piping works; HDPE piping works; GRP piping works; valves.             |
| <b>Week 3</b>                   | Water distribution systems: Description of water distribution systems; analysis and design of water distribution systems.                                          |
| <b>Week 4</b>                   | Water pumping stations: Types of pumping stations; types of pumps; pumps power; system head curve; pump characteristics curves; pumps connection; pumps selection. |
| <b>Week 5</b>                   | Water treatment: Aim of water treatment; description and design of Intake structure; description and design of rapid mix unit; coagulation process                 |
| <b>Week 6</b>                   | Water treatment: description and design of flocculation unit; sedimentation process; description and design of sedimentation unit                                  |

|                |                                                                                                                                                                     |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 7</b>  | Water treatment: description and design of filtration systems; description and design of disinfection systems.                                                      |
| <b>Week 8</b>  | Mid-term Exam; Quantity of sanitary sewage and storm water                                                                                                          |
| <b>Week 9</b>  | Flow in sewers; Design of sewer systems                                                                                                                             |
| <b>Week 10</b> | Treatment of sanitary sewage: General introduction, flowsheet of a conventional sanitary sewage plant, description and design of screening unit                     |
| <b>Week 11</b> | Treatment of sanitary sewage: description and design of grit removal unit                                                                                           |
| <b>Week 12</b> | Treatment of sanitary sewage: description and design of primary sedimentation unit                                                                                  |
| <b>Week 13</b> | Treatment of sanitary sewage: description and design of biological treatment systems; description and design of secondary sedimentation unit                        |
| <b>Week 14</b> | Sludge treatment: Design and description of gravity thickening unit; design and description of anaerobic digestion unit; design and description of dewatering unit. |
| <b>Week 15</b> | A preparatory week before the final exam                                                                                                                            |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                                                                                       |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

|               | Material Covered                                            |
|---------------|-------------------------------------------------------------|
| <b>Week 1</b> | • تحديد درجة الحرارة (Temperature)                          |
| <b>Week 2</b> | • قياس العكورة (Turbidity)                                  |
| <b>Week 3</b> | • قياس اللون (Color)                                        |
| <b>Week 4</b> | • قياس المواد الصلبة الكلية (Total Solids - TS)             |
| <b>Week 5</b> | • قياس المواد الصلبة العالقة (Total Suspended Solids - TSS) |
| <b>Week 6</b> | • قياس المواد الصلبة الذائبة (Total Dissolved Solids - TDS) |
| <b>Week 7</b> | • تحديد درجة الحرارة (Temperature)                          |

| Learning and Teaching Resources |                                                                                                                                                |                           |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| مصادر التعلم والتدريس           |                                                                                                                                                |                           |
|                                 | Text                                                                                                                                           | Available in the Library? |
| Required Texts                  | McGhee, T.J., "Water Supply and Sewage", 6 <sup>th</sup> Ed., McGraw Hill, Tokyo, 1991.                                                        | Yes                       |
| Recommended Texts               | Viessman, W., Hammer, M.J., Perez, E.M., Chdik, P.A., Water supply and pollution control, 6 <sup>th</sup> Ed., Pearson Education Limited 2014. | No                        |
| Websites                        |                                                                                                                                                |                           |

| Grading Scheme                                                                                                                                                                                                                                                                                                                                                                       |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                                         |                  |                     |           |                                       |
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                          | A - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | B - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | C - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | D - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | E - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                               | FX – Fail        | راسب (قيد المعالجة) | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | F – Fail         | راسب                | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                  |                     |           |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                  |                     |           |                                       |

| Module Information                 |                              |                               |                                                                                                                                                                                                                               |  |
|------------------------------------|------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية            |                              |                               |                                                                                                                                                                                                                               |  |
| Module Title                       | <b>Engineering Hydrology</b> |                               | Module Delivery                                                                                                                                                                                                               |  |
| Module Type                        | Core                         |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Code                        | <b>CE418</b>                 |                               |                                                                                                                                                                                                                               |  |
| ECTS Credits                       | 4                            |                               |                                                                                                                                                                                                                               |  |
| SWL (hr/sem)                       | <b>100</b>                   |                               |                                                                                                                                                                                                                               |  |
| Module Level                       | 4                            | Semester of Delivery          | 2                                                                                                                                                                                                                             |  |
| Administering Department           | Type Dept. Code              | College                       | Type College Code                                                                                                                                                                                                             |  |
| Module Leader                      |                              | e-mail                        |                                                                                                                                                                                                                               |  |
| Module Leader's Acad. Title        |                              | Module Leader's Qualification |                                                                                                                                                                                                                               |  |
| Module Tutor                       |                              | e-mail                        |                                                                                                                                                                                                                               |  |
| Peer Reviewer Name                 | Name                         | e-mail                        | E-mail                                                                                                                                                                                                                        |  |
| Scientific Committee Approval Date | 1\9\2025                     | Version Number                | 1.0                                                                                                                                                                                                                           |  |

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

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | 1. Preparing and qualifying specialized engineers to meet the requirements of the labor market in the private and public sectors in civil engineering through diversification of methods of learning and education and training students to apply the acquired knowledge and skills to solve real problems.<br>2. Providing distinguished academic programs in the field of civil engineering, both theoretical and practical, that comply with international standards of academic quality and meet the needs of the labor market.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | 1- Outline the physical processes in the context of hydrology, including the hydrological cycle in general.<br>2- Define and understand key concepts related to hydrology, such as relative and cumulative frequency, the use of statistical data distributions, time of concentration, runoff and rainfall hydrographs, catchment storage, flood routing.<br>3- Apply a range of common techniques, such as flood frequency analysis, probabilistic rational, to estimate design peak flows.<br>4- Apply runoff-routing methods, rainfall hyetograph estimation to estimate flood hydrographs.<br>5- Compare and evaluate a number of methods for determining peak flows and flood hydrographs for urban and rural areas, including flood frequency analysis, the rational methods, the regional method and runoff routing methods.<br>6- Apply and evaluate stochastic modelling techniques and water storage behavior analysis to estimate the yield of a small rural water supply system.<br>7- Define and describe processes groundwater systems. Application the Darcy's law to determine groundwater. |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | This course serves as an introduction to the field of engineering hydrology. It covers fundamentals such as the hydrological cycle, catchment, hyetographs, losses, and hydrographs. Design topics covered will be selected from: flood frequency analysis, determination of design rainfall intensity and hyetographs, peak flow estimation, design hydrograph estimation, and groundwater process.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                            |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, and interactive tutorials. |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

| Module Evaluation           |                       |             |                  |               |                           |
|-----------------------------|-----------------------|-------------|------------------|---------------|---------------------------|
| تقييم المادة الدراسية       |                       |             |                  |               |                           |
|                             |                       | Time/Number | Weight (Marks)   | Week Due      | Relevant Learning Outcome |
| <b>Formative assessment</b> | <b>Quizzes</b>        | 2           | 10% (10)         | 3 , 7         | All                       |
|                             | <b>Assignments</b>    | 2           | 10% (10)         | 2,4,6,8,10,12 | All                       |
|                             | <b>Class activity</b> | 1           | 10% (10)         |               |                           |
|                             | <b>Report</b>         | 1           | 10% (10)         |               |                           |
| <b>Summative assessment</b> | <b>Midterm Exam</b>   | 1 hr        | 10% (10)         | 10            | 1-5                       |
|                             | <b>Final Exam</b>     | 2hr         | 50% (50)         | 16            | All                       |
| <b>Total assessment</b>     |                       |             | 100% (100 Marks) |               |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                           |
|---------------------------------|-------------------------------------------------------------------------------------------|
| المناهج الاسبوعي النظري         |                                                                                           |
|                                 | Material Covered                                                                          |
| <b>Week 1</b>                   | Introduction and Hydrologic Cycle                                                         |
| <b>Week 2</b>                   | Precipitations: Forms of Precipitations, Rainfall intensity, Measurement of Precipitation |
| <b>Week 3</b>                   | Precipitations: Mean Areal Depth of Precipitation, Frequency of Point Rainfall            |
| <b>Week 4</b>                   | Losses: Evaporation                                                                       |
| <b>Week 5</b>                   | Losses: Infiltration:                                                                     |
| <b>Week 6</b>                   | Runoff: Methods of estimation of runoff                                                   |
| <b>Week 7</b>                   | Flow Measurement: Water Stage Measurement, Measurements of Discharge                      |

|                |                                                                                                          |
|----------------|----------------------------------------------------------------------------------------------------------|
| <b>Week 8</b>  | Flow Measurement: Stage-Discharge rating curve, Reservoir mass curve and storage                         |
| <b>Week 9</b>  | Hydrographs: components of a hydrograph, factors affecting hydrograph, hydrograph separation             |
| <b>Week 10</b> | Hydrographs: unit hydrograph, the average unit-hydrograph, the unit-hydrograph from multi- period storms |
| <b>Week 11</b> | Hydrographs: The Conversion of U-H Duration, Synthetic UH                                                |
| <b>Week 12</b> | Flood Routing: Hydrologic Storage Routing                                                                |
| <b>Week 13</b> | Flood Routing: Hydrologic Channel Routing                                                                |
| <b>Week 14</b> | An introduction to Groundwater Hydrology                                                                 |
| <b>Week 15</b> | An introduction to Groundwater Hydrology                                                                 |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                            |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

|                       | Text                                 | Available in the Library? |
|-----------------------|--------------------------------------|---------------------------|
| <b>Required Texts</b> | Engineering hydrology / E. M. Wilson | Yes                       |

|                   |                                   |    |
|-------------------|-----------------------------------|----|
| Recommended Texts | Engineering hydrology/ Subramanya | No |
| Websites          |                                   |    |

| Grading Scheme<br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                       |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                          | A - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | B - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | C - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | D - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | E - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                               | FX – Fail        | راسب (قيد المعالجة) | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | F – Fail         | راسب                | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                  |                     |           |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                  |                     |           |                                       |

| Module Information                 |                  |                      |                                                                                                                                                                                                                                          |   |
|------------------------------------|------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| معلومات المادة الدراسية            |                  |                      |                                                                                                                                                                                                                                          |   |
| Module Title                       | Highway Pavement |                      | Module Delivery                                                                                                                                                                                                                          |   |
| Module Type                        | Core             |                      | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |   |
| Module Code                        | CE415            |                      |                                                                                                                                                                                                                                          |   |
| ECTS Credits                       | 8                |                      |                                                                                                                                                                                                                                          |   |
| SWL (hr/sem)                       | 200              |                      |                                                                                                                                                                                                                                          |   |
| Module Level                       | 4                | Semester of Delivery |                                                                                                                                                                                                                                          | 2 |
| Administering Department           | Type Dept. Code  | College              | Type College Code                                                                                                                                                                                                                        |   |
| Module Leader                      |                  |                      | e-mail                                                                                                                                                                                                                                   |   |
| Module Leader's Acad. Title        |                  |                      | Module Leader's Qualification                                                                                                                                                                                                            |   |
| Module Tutor                       |                  |                      | e-mail                                                                                                                                                                                                                                   |   |
| Peer Reviewer Name                 | Name             | e-mail               | E-mail                                                                                                                                                                                                                                   |   |
| Scientific Committee Approval Date | 1\9\2025         | Version Number       | 1.0                                                                                                                                                                                                                                      |   |

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | 1- The course aims to present the basic elements of geometric design for highways and deals with the dimensions and layout of visible features of the highway. The features normally considered are the cross-section elements, sight distance consideration, horizontal curvature, gradients, and intersection.<br>2- The course aims to present the basic element for designing the pavement (flexible & Rigid) also analyze all stresses and applied loads on the pavement and take into consideration choosing the materials used in the pavement construction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | 1- Gives us an idea about the roads of ancient times.<br>2- The emphasis of the geometric design is to address the requirement of the driver and the vehicle such as safety, comfort, efficiency, etc.<br>3- The characteristics of cross-sectional elements are important in highway geometric design because they influence safety and comfort.<br>4- Horizontal alignment is one of the most important features influencing the efficiency and safety of a highway.<br>5- Knowledge and Understanding of highway design features.<br>6- Bituminous materials, Natural Asphalt, constituents of asphalt cement, and test of asphalt.<br>7- The emphasis of the different aggregate characteristics with size and gradation, and methods of blending for dry mix design.<br>8- Bituminous mix design, with the objective of mix design.<br>9- Study of stress distribution through the pavement with the calculation of flexible pavement stresses and deflections.<br>10- Knowledge and Understanding of pavement design and analysis. |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | Indicative content includes the following:<br>Part A – Highway Engineering<br>- Proper design of a horizontal curve, including elements within a single curve and consistency of curvature along a highway.<br>3<br>Module Evaluation<br>- Design speed is the single most important factor that affects the geometric design.<br>- Derive and evaluate the information needed to apply engineering analysis methods to unfamiliar problems.<br>- Soil stabilization methods and classification.<br>- Highway Drainage and Design Equation<br>Part B – Pavement Design and Analysis<br>- Study of stress distribution through the pavement with the calculation of flexible pavement stresses and deflections.<br>- Flexible pavement design methods (CBR method and AASHTO Design method).<br>- Rigid pavement types and types of joints in the rigid pavement, and temperature stresses.                                                                                                                                               |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                      |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | Scientific and research skills are developed through teaching and learning activities. Analysis and design-solving skills are further developed by employing a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to. |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ 15 اسبوعا

|                                                                                |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | 250 |                                                                           |     |

## Module Evaluation

تقييم المادة الدراسية

|                             |                       | Time/Number | Weight (Marks)   | Week Due      | Relevant Learning Outcome |
|-----------------------------|-----------------------|-------------|------------------|---------------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>        | 2           | 10% (10)         | 3 , 7         | All                       |
|                             | <b>Assignments</b>    | 2           | 10% (10)         | 2,4,6,8,10,12 | All                       |
|                             | <b>Class activity</b> | 1           | 10% (10)         |               |                           |
|                             | <b>Report</b>         | 1           | 10% (10)         |               |                           |
| <b>Summative assessment</b> | <b>Midterm Exam</b>   | 1 hr        | 10% (10)         | 10            | 1-5                       |
|                             | <b>Final Exam</b>     | 2hr         | 50% (50)         | 16            | All                       |
| <b>Total assessment</b>     |                       |             | 100% (100 Marks) |               |                           |

## Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

|               | Material Covered                                                 |
|---------------|------------------------------------------------------------------|
| <b>Week 1</b> | Introduction                                                     |
| <b>Week 2</b> | Bituminous Materials, Test for Asphalt                           |
| <b>Week 3</b> | Bituminous Materials, Test for Asphalt                           |
| <b>Week 4</b> | Aggregate, Physical Properties of Aggregate, Methods of Blending |

|                |                                                                                         |
|----------------|-----------------------------------------------------------------------------------------|
| <b>Week 5</b>  | Aggregate, Physical Properties of Aggregate, Methods of Blending                        |
| <b>Week 6</b>  | Bituminous Mix Design, Marshal Mix Design                                               |
| <b>Week 7</b>  | Bituminous Mix Design, Marshal Mix Design                                               |
| <b>Week 8</b>  | Stress distribution through the pavement, Calculation of stresses and deflections       |
| <b>Week 9</b>  | Stress distribution through the pavement, Calculation of stresses and deflections       |
| <b>Week 10</b> | Design Introduction to Pavement, Types of Pavements, CBR Design Method                  |
| <b>Week 11</b> | Design Introduction to Pavement, Types of Pavements, CBR Design Method                  |
| <b>Week 12</b> | Stabilized Bases & Subbases, Earthworks & Subgrades, Control of Embankment Construction |
| <b>Week 13</b> | Flexible pavement design methods, AASHTO Design Methods                                 |
| <b>Week 14</b> | Rigid Pavement, Rigid Pavement Types, Types of Joints in Rigid Pavement                 |
| <b>Week 15</b> | Rigid Pavement, Critical load position, Temperature Stresses                            |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                           |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|               | <b>Material Covered</b>                                 |
|---------------|---------------------------------------------------------|
| <b>Week 1</b> | California Bearing Ratio CBR Test                       |
| <b>Week 2</b> | Bitumen Penetration Test                                |
| <b>Week 3</b> | Bitumen Ductility Tests                                 |
| <b>Week 4</b> | Specific Gravity Test of Bitumen                        |
| <b>Week 5</b> | Bitumen Softening Test                                  |
| <b>Week 6</b> | Viscosity Test of Bitumen, Flash Point Tests of Bitumen |
| <b>Week 7</b> | Marshall Tests                                          |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                                                       | Available in the Library? |
|-------------------|------------------------------------------------------------|---------------------------|
| Required Texts    | Handbook of Transportation Engineering. By Myer Kutz.2004. | Yes                       |
| Recommended Texts |                                                            | No                        |
| Websites          |                                                            |                           |

## Grading Scheme

مخطط الدرجات

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

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

| Module Information                 |                 |                      |                                                                                                                                                                                                                                          |  |
|------------------------------------|-----------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية            |                 |                      |                                                                                                                                                                                                                                          |  |
| Module Title                       | Water Supply    |                      | Module Delivery                                                                                                                                                                                                                          |  |
| Module Type                        | Core            |                      | <input type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Code                        | CE417           |                      |                                                                                                                                                                                                                                          |  |
| ECTS Credits                       | 4               |                      |                                                                                                                                                                                                                                          |  |
| SWL (hr/sem)                       | 100             |                      |                                                                                                                                                                                                                                          |  |
| Module Level                       | 4               | Semester of Delivery | 2                                                                                                                                                                                                                                        |  |
| Administering Department           | Type Dept. Code | College              | Type College Code                                                                                                                                                                                                                        |  |
| Module Leader                      |                 |                      | e-mail                                                                                                                                                                                                                                   |  |
| Module Leader's Acad. Title        |                 |                      | Module Leader's Qualification                                                                                                                                                                                                            |  |
| Module Tutor                       |                 |                      | e-mail                                                                                                                                                                                                                                   |  |
| Peer Reviewer Name                 | Name            | e-mail               | E-mail                                                                                                                                                                                                                                   |  |
| Scientific Committee Approval Date | 1\9\2025        | Version Number       | 1.0                                                                                                                                                                                                                                      |  |

| Relation with other Modules       |                            |          |  |
|-----------------------------------|----------------------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                            |          |  |
| Prerequisite module               | Water supply and treatment | Semester |  |
| Co-requisites module              | None                       | Semester |  |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | <p>This module introduces the fundamental principles and engineering practices of water supply systems. It provides students with the knowledge required to estimate water demand, identify water sources, assess water quality, and design the main components of water supply systems, including intake structures, transmission pipelines, pumping stations, storage reservoirs, and water distribution networks. The course also covers conventional water treatment processes and relevant design standards to ensure the delivery of safe and reliable drinking water.</p>                                                                                                                                                                                                                                                                                                                                                              |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <p>Upon successful completion of this module, students will be able to:</p> <ol style="list-style-type: none"> <li>10. Explain the principles and components of water supply engineering systems.</li> <li>11. Estimate present and future water demand for communities.</li> <li>12. Evaluate different water sources and assess their suitability for potable water supply.</li> <li>13. Analyze water quality parameters and select appropriate treatment processes.</li> <li>14. Design intake structures, transmission mains, pumping stations, storage reservoirs, and water distribution networks.</li> <li>15. Apply hydraulic principles in the analysis and design of water supply systems.</li> <li>16. Use engineering standards and design codes in planning and designing water supply projects.</li> </ol>                                                                                                                     |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | <ul style="list-style-type: none"> <li>• Introduction to water supply engineering and public health considerations.</li> <li>• Water demand estimation and population forecasting.</li> <li>• Sources of water supply (surface water and groundwater).</li> <li>• Water quality standards and water quality analysis.</li> <li>• Water treatment processes: screening, aeration, coagulation, flocculation, sedimentation, filtration, and disinfection.</li> <li>• Design of intake structures and transmission pipelines.</li> <li>• Pumping stations and selection of pumps.</li> <li>• Service reservoirs and storage facilities.</li> <li>• Water distribution systems and network analysis.</li> <li>• Pipe materials, valves, fittings, and appurtenances.</li> <li>• Operation, maintenance, and management of water supply systems.</li> <li>• Design examples based on engineering standards and practical applications.</li> </ul> |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <p>Different teaching methods will be employed to achieve the course objectives, including lectures, classroom discussions, worked design examples, and problem-solving sessions. PowerPoint presentations and engineering design standards will be used to explain theoretical concepts and practical applications. Students will complete assignments and design exercises to strengthen analytical and engineering design skills. Regular participation in classroom activities and independent study of lecture notes are expected to enhance learning outcomes.</p> |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ 15 اسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

| Module Evaluation           |                       |             |                  |               |                           |
|-----------------------------|-----------------------|-------------|------------------|---------------|---------------------------|
| تقييم المادة الدراسية       |                       |             |                  |               |                           |
|                             |                       | Time/Number | Weight (Marks)   | Week Due      | Relevant Learning Outcome |
| <b>Formative assessment</b> | <b>Quizzes</b>        | 2           | 10% (10)         | 3 , 7         | All                       |
|                             | <b>Assignments</b>    | 2           | 10% (10)         | 2,4,6,8,10,12 | All                       |
|                             | <b>Class activity</b> | 1           | 10% (10)         |               |                           |
|                             | <b>Report</b>         | 1           | 10% (10)         |               |                           |
| <b>Summative assessment</b> | <b>Midterm Exam</b>   | 1 hr        | 10% (10)         | 10            | 1-5                       |
|                             | <b>Final Exam</b>     | 2hr         | 50% (50)         | 16            | All                       |
| <b>Total assessment</b>     |                       |             | 100% (100 Marks) |               |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                                                      |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                                                                                      |
|                                 | Material Covered                                                                                                     |
| <b>Week 1</b>                   | Introduction to Water Supply Engineering, objectives, components of water supply systems, and public health aspects. |
| <b>Week 2</b>                   | Water demand estimation, per capita consumption, demand variations, and population forecasting methods.              |
| <b>Week 3</b>                   | Sources of water supply: Surface water, groundwater, springs, and selection criteria.                                |
| <b>Week 4</b>                   | Water quality characteristics, physical, chemical, and biological parameters, and drinking water standards.          |
| <b>Week 5</b>                   | .                                                                                                                    |

|                |                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------|
| <b>Week 6</b>  | Water intake structures and transmission systems.                                                           |
| <b>Week 7</b>  | Water treatment processes: Screening, aeration, coagulation, and flocculation.                              |
| <b>Week 8</b>  | Sedimentation and filtration processes in water treatment plants.                                           |
| <b>Week 9</b>  | Disinfection methods, chlorination, and water treatment plant layout.                                       |
| <b>Week 10</b> | Pumping stations, pump selection, and hydraulic considerations.                                             |
| <b>Week 11</b> | Water storage reservoirs, balancing storage, and elevated tanks.                                            |
| <b>Week 12</b> | Water distribution systems, network layouts, and pipe materials.                                            |
| <b>Week 13</b> | Hydraulic analysis of water distribution networks and pressure management.                                  |
| <b>Week 14</b> | Design of water supply systems using engineering standards and design examples.                             |
| <b>Week 15</b> | Operation, maintenance, and management of water supply systems, including leakage control and water losses. |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                                                               |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

|        | Material Covered                                             |
|--------|--------------------------------------------------------------|
| Week 1 | • قياس العكورة (Turbidity)                                   |
| Week 2 | • قياس الرقم الهيدروجيني (pH Value)                          |
| Week 3 | • تعيين العسر الكلي والجزئي (Total and Partial Hardness)     |
| Week 4 | • تعيين القلوية والحموضة (Alkalinity and Acidity)            |
| Week 5 | • قياس الأملاح الذائبة الكلية (Total Dissolved Solids - TDS) |
| Week 6 | • قياس التوصيلية الكهربائية (Electrical Conductivity - EC)   |
| Week 7 | • قياس الكلور المتبقي (Residual Chlorine)                    |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                | Text                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Available in the Library? |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Required Texts | 1. Fundamentals of Behavioral Statistics, 1988, Peurifoy Robert L, and Ledbetter, William B. "Construction Planning, Equipment & Methods" 4th Edition, McGraw-Hill, 1985.<br>2. Nunnally, S. W. "Construction Methods and Management", 7th Edition, Upper Saddle River, New Jersey: Prentice Hall, 2007.<br>3. Dutta, B. N. "Estimating and Costing in Civil Engineering-Theory and Practice", 24th Edition, USB Publishers' Distributors Ltd., New Delhi, 1999. | Yes                       |

## Grading Scheme

مخطط الدرجات

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

| Module Information                 |                    |                               |                                                                                                                                                                                                                               |
|------------------------------------|--------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                    |                               |                                                                                                                                                                                                                               |
| Module Title                       | Ethics engineering |                               | Module Delivery                                                                                                                                                                                                               |
| Module Type                        | Core               |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | CE416              |                               |                                                                                                                                                                                                                               |
| ECTS Credits                       | 8                  |                               |                                                                                                                                                                                                                               |
| SWL (hr/sem)                       | 200                |                               |                                                                                                                                                                                                                               |
| Module Level                       | 4                  | Semester of Delivery          | 2                                                                                                                                                                                                                             |
| Administering Department           | Type Dept. Code    | College                       | Type College Code                                                                                                                                                                                                             |
| Module Leader                      | e-mail             |                               |                                                                                                                                                                                                                               |
| Module Leader's Acad. Title        |                    | Module Leader's Qualification |                                                                                                                                                                                                                               |
| Module Tutor                       | e-mail             |                               |                                                                                                                                                                                                                               |
| Peer Reviewer Name                 | Name               | e-mail                        | E-mail                                                                                                                                                                                                                        |
| Scientific Committee Approval Date | 1\9\2025           | Version Number                | 1.0                                                                                                                                                                                                                           |

| Relation with other Modules       |                                      |          |  |
|-----------------------------------|--------------------------------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                                      |          |  |
| Prerequisite module               | Concrete design, Mathematics, Survey | Semester |  |
| Co-requisites module              | None                                 | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | This module introduces students to the fundamental principles of professional ethics and ethical responsibility in engineering practice. It aims to develop students' understanding of ethical values, professional conduct, legal responsibilities, sustainability, and social accountability. The course emphasizes ethical decision-making, integrity, teamwork, leadership, and compliance with professional codes of ethics in civil engineering and related professions. |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <p>Upon successful completion of this module, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the principles and importance of professional ethics in engineering practice.</li> <li>2. Apply ethical reasoning to solve professional and engineering-related dilemmas.</li> <li>3. Recognize the legal, social, and environmental responsibilities of engineers.</li> <li>4. Demonstrate honesty, integrity, and accountability in professional activities.</li> <li>5. Work effectively within multidisciplinary teams while respecting professional values.</li> <li>6. Identify and apply national and international engineering codes of ethics.</li> <li>7. Appreciate the importance of lifelong learning and continuous professional development.</li> </ol> |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | <ul style="list-style-type: none"> <li>• Introduction to professional ethics and ethical theories.</li> <li>• Professional responsibility and accountability.</li> <li>• Engineering codes of ethics and professional standards.</li> <li>• Integrity, honesty, and conflict of interest.</li> <li>• Ethical decision-making in engineering practice.</li> <li>• Occupational health and safety responsibilities.</li> <li>• Environmental ethics and sustainable development.</li> <li>• Social responsibility and public welfare.</li> <li>• Teamwork, leadership, and professional communication.</li> <li>• Intellectual property rights and confidentiality.</li> <li>• Legal aspects of engineering practice.</li> <li>• Case studies on ethical issues in civil engineering.</li> </ul>          |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>The course will be delivered through lectures, classroom discussions, case studies, and interactive learning activities. Students will analyze real engineering ethical dilemmas, participate in group discussions and presentations, and complete assignments that enhance ethical reasoning and professional judgment. PowerPoint presentations, videos, and professional engineering codes will be used to support learning. Students are encouraged to actively participate in discussions and independently review relevant ethical standards and professional guidelines.</p> |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ 15 اسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

| Module Evaluation     |                |             |                  |               |                           |
|-----------------------|----------------|-------------|------------------|---------------|---------------------------|
| تقييم المادة الدراسية |                |             |                  |               |                           |
|                       |                | Time/Number | Weight (Marks)   | Week Due      | Relevant Learning Outcome |
| Formative assessment  | Quizzes        | 2           | 10% (10)         | 3 , 7         | All                       |
|                       | Assignments    | 2           | 10% (10)         | 2,4,6,8,10,12 | All                       |
|                       | Class activity | 1           | 10% (10)         |               |                           |
|                       | Report         | 1           | 10% (10)         |               |                           |
| Summative assessment  | Midterm Exam   | 1 hr        | 10% (10)         | 10            | 1-5                       |
|                       | 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 professional ethics and engineering ethics. |
| Week 2                          | Ethical theories and moral principles.                      |
| Week 3                          | Professional responsibility and accountability.             |
| Week 4                          | Engineering codes of ethics and professional conduct.       |
| Week 5                          | Integrity, honesty, and conflict of interest.               |
| Week 6                          | Ethical decision-making and problem-solving methods.        |
| Week 7                          | Occupational health, safety, and ethical responsibilities.  |
| Week 8                          | Midterm Examination.                                        |
| Week 9                          | Environmental ethics and sustainable development.           |

|                |                                                                          |
|----------------|--------------------------------------------------------------------------|
| <b>Week 10</b> | Social responsibility and public welfare.                                |
| <b>Week 11</b> | Teamwork, leadership, and professional communication.                    |
| <b>Week 12</b> | Intellectual property rights and confidentiality.                        |
| <b>Week 13</b> | Legal responsibilities of engineers and engineering practice.            |
| <b>Week 14</b> | Case studies in engineering ethics.                                      |
| <b>Week 15</b> | Contemporary ethical issues in engineering and professional development. |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                            |

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

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                                                                                                                                |                           |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                                 | Text                                                                                                                                           | Available in the Library? |
| <b>Required Texts</b>                                           | McGhee, T.J., "Water Supply and Sewage", 6 <sup>th</sup> Ed., McGraw Hill, Tokyo, 1991.                                                        | Yes                       |
| <b>Recommended Texts</b>                                        | Viessman, W., Hammer, M.J., Perez, E.M., Chdik, P.A., Water supply and pollution control, 6 <sup>th</sup> Ed., Pearson Education Limited 2014. | No                        |

| Module Information                 |                             |                      |                                                                                                                                                                                                                               |  |
|------------------------------------|-----------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية            |                             |                      |                                                                                                                                                                                                                               |  |
| Module Title                       | <b>Hydraulic Structures</b> |                      | Module Delivery                                                                                                                                                                                                               |  |
| Module Type                        | Core                        |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Code                        | <b>CE414</b>                |                      |                                                                                                                                                                                                                               |  |
| ECTS Credits                       | 4                           |                      |                                                                                                                                                                                                                               |  |
| SWL (hr/sem)                       | <b>100</b>                  |                      |                                                                                                                                                                                                                               |  |
| Module Level                       | 4                           | Semester of Delivery | 2                                                                                                                                                                                                                             |  |
| Administering Department           | Type Dept. Code             | College              | Type College Code                                                                                                                                                                                                             |  |
| Module Leader                      |                             |                      | e-mail                                                                                                                                                                                                                        |  |
| Module Leader's Acad. Title        |                             |                      | Module Leader's Qualification                                                                                                                                                                                                 |  |
| Module Tutor                       |                             |                      | e-mail                                                                                                                                                                                                                        |  |
| Peer Reviewer Name                 | Name                        | e-mail               | E-mail                                                                                                                                                                                                                        |  |
| Scientific Committee Approval Date | 1\9\2025                    | Version Number       | 1.0                                                                                                                                                                                                                           |  |

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

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                          |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                          |
| <b>Module Aims</b><br>أهداف المادة الدراسية              | 1- To study and design the different types of hydraulic structures.<br>2- Understand the causes of failure of the hydraulic structures and its solutions.<br>3-To choose a suitable hydraulic structures in the project. |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | 1- Discuss the types of hydraulic structures according to its purposes.<br>2- Discuss the causes of failure of hydraulic structures.<br>3- Explain the different methods of floor design of the hydraulic structures.<br>4- Define and explain of the energy dissipation structures.<br>5- Define and design of stilling basins.<br>6- Explain and design of different types of culvert.<br>7- Discuss and design of pipe aqueduct and flume.<br>8- Define and design of siphon.<br>9- Study and design a steel vertical gates. |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | Indicative content includes the following:<br>1- Types the hydraulic structures , causes of failure and design of floor . (16 hrs)<br>2- Design of regulator and stilling basin with hydraulic jump . (12 hrs)<br>3- Design of crossing hydraulic structures .(16 hrs)<br>4- Study the sliding gates and its design. (6 hrs)<br>5- Revision problem classes. ( 6hrs)                                                                                                                                                            |

### Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |                                                                                                               |
|-------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | The students participation in the exercises and solved a problem in the class to expand the thinking skills . |
|-------------------|---------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

|                                                                                |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 142 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 10  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 108 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 250 |                                                                           |     |

### Module Evaluation

تقييم المادة الدراسية

|                             |                       | Time/Number | Weight (Marks) | Week Due      | Relevant Learning Outcome |
|-----------------------------|-----------------------|-------------|----------------|---------------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>        | 2           | 10% (10)       | 3 , 7         | All                       |
|                             | <b>Assignments</b>    | 2           | 10% (10)       | 2,4,6,8,10,12 | All                       |
|                             | <b>Class activity</b> | 1           | 10% (10)       |               |                           |
|                             | <b>Report</b>         | 1           | 10% (10)       |               |                           |

|                             |                     |      |                  |    |     |
|-----------------------------|---------------------|------|------------------|----|-----|
| <b>Summative assessment</b> | <b>Midterm Exam</b> | 1 hr | 10% (10)         | 10 | 1-5 |
|                             | <b>Final Exam</b>   | 2hr  | 50% (50)         | 16 | All |
| <b>Total assessment</b>     |                     |      | 100% (100 Marks) |    |     |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                                                  |
|-------------------------------------------------------------------|------------------------------------------------------------------|
|                                                                   | <b>Material Covered</b>                                          |
| <b>Week 1</b>                                                     | Introduction, types of hydraulic structures.                     |
| <b>Week 2</b>                                                     | Steps for design of hydraulic structures, site conditions.       |
| <b>Week 3</b>                                                     | Causes of failure of hydraulic structures, Bligh's creep theory. |
| <b>Week 4</b>                                                     | Lane's weighted creep theory.                                    |
| <b>Week 5</b>                                                     | Khosla 's theory.                                                |
| <b>Week 6</b>                                                     | Solved problems of pervious methods.                             |
| <b>Week 7</b>                                                     | Hydraulic design of regulators.                                  |
| <b>Week 8</b>                                                     | Solved problems about design of the regulators.                  |
| <b>Week 9</b>                                                     | Hydraulic jump and solved problems.                              |
| <b>Week 10</b>                                                    | Design of vertical drop.                                         |
| <b>Week 11</b>                                                    | Design of stilling basins.                                       |
| <b>Week 12</b>                                                    | Design of pipes and box culverts.                                |
| <b>Week 13</b>                                                    | Design of pipe aqueduct and flume.                               |
| <b>Week 14</b>                                                    | Design of siphon .                                               |
| <b>Week 15</b>                                                    | Design of sliding steel gates .                                  |
| <b>Week 16</b>                                                    | <b>Preparatory week before the final Exam</b>                    |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                                                                     | Available in the Library? |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | 1- Irrigation, water power and water resources engineering. By Arora (2007)<br>2- Hydraulic structures by (Novak) (2007) | Yes                       |
| <b>Recommended Texts</b> | Theory and design of Irrigation structures. By (Gupta).                                                                  | No                        |
| <b>Websites</b>          |                                                                                                                          |                           |

## Grading Scheme

مخطط الدرجات

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

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

