

**Ministry of Higher Education and Scientific Research  
Scientific Supervision and Scientific Evaluation Apparatus  
Directorate of Quality Assurance and Academic Accreditation  
Accreditation Department**



# **Academic Program and Course Description Guide**

2026

## **Introduction:**

The educational program is a structured set of courses designed to develop students' skills, preparing them for labor market requirements. This program is reviewed and evaluated annually through internal or external audit procedures.

The academic program description provides a summary of the program's content and its courses, outlining the skills students acquire in alignment with its academic objectives. This description is a fundamental component in obtaining program accreditation and is prepared by faculty members under the supervision of the department's scientific committees.

This guide includes updates to the academic description based on recent developments in the Iraqi educational system. It encompasses the description of traditional programs (semester-based, Courses) in addition to adopting the description of academic programs according to the Bologna Process, as stated in the directive of the Directorate of Studies No. T.M.3/2906 dated 3/5/2023.

In this context, we emphasize the importance of accurately documenting academic program and course descriptions to ensure the continuous improvement of the educational process.

## **Concepts and terminology:**

**Academic Program Description:** Provides a brief summary outlining the program's vision, mission, and objectives, including a precise description of the intended learning outcomes based on specific learning strategies.

**Course Description:** Highlights the key features of the course and the expected learning outcomes that students should achieve. This helps assess the extent of their benefit from available learning opportunities and is derived from the program description.

**Program Vision:** An ambitious depiction of the program's future, making it progressive, inspiring, realistic, and feasible.

**Program Mission:** Defines the objectives and activities required to achieve them while outlining the program's development paths and directions.

**Program Objectives:** Statements describing what the program aims to accomplish within a specific timeframe. These objectives must be measurable and observable.

**Curriculum Structure:** Includes all courses within the academic program according to the adopted learning system (semester-based, annual, Bologna Process). It encompasses ministry, university, college, and department requirements, specifying the number of credit hours for each course.

**Learning Outcomes:** The knowledge, skills, and values that students acquire upon successfully completing the academic program. Learning outcomes must be defined for each course to align with the program's objectives.

**Teaching and Learning Strategies:** The methods employed by faculty members to enhance student learning. These include all in-class and extracurricular activities designed to achieve the desired learning outcomes.

## Academic Program Description Form

University Name: Mosul

Faculty/Institute: Engineering

Scientific Department: Civil Engineering

Academic or Professional Program Name: Bachelor Civil Engineering

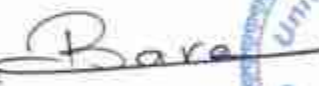
Final Certificate Name: Bachelor of Science in Civil Engineering

Academic System: Bologna Process (First, Second and Third Levels),  
Courses (Fourth Level)

Description Preparation Date: 16-04-2026

File Completion Date: 16-04-2026

Signature:



Head of Department Name:

Assist. Prof. Dr. Beran Jabbar

Date: 19/04/2026



Signature:



Scientific Associate Name:

Assist. Prof. Dr. Ayman Talib

Date: 19-4-2026 Hameed

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 19/04/2026

Asst. Prof. Rama Bushan Abdulrahman

Signature:



Approval of the Dean

Asst. Prof. Omar M. Hamdoon

19-4



## **1. Program Vision**

Developing engineering education in the field of civil engineering to achieve excellence and deliver innovative, high-quality educational programs.

## **2. Program Mission**

Preparing specialized civil engineers with a high level of scientific excellence to keep up with advancements in curricula and scientific research, utilizing these capabilities to serve the community and develop public and private institutions while adhering to human, ethical, and professional values.

## **3. Program Objectives**

- Acquiring fundamental knowledge and skills in civil engineering, specializing in structures, geotechnics, and transportation, to serve the community and facilitate membership in professional associations.
- Establishing engineering practice in civil engineering to meet societal needs.
- Engaging in continuous learning to ensure professional development.
- Gaining creative knowledge that enables graduates to acquire problem solving skills and adapt to rapid and emerging technologies in structural engineering, geotechnics, and transportation, in addition to continuing lifelong learning activities.

## **4. Program Accreditation**

The program is under review by the National Council for the Accreditation of Engineering Education (ICAEE).

## **5. Other external influences**

### 6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	9	20	0.092	There are three academic systems in the department: Bologna, Semester-based, and Course-based.
College Requirements	2	4	0.018	
Department Requirements	51	192 216	0.89	
Summer Training	1	Met or Not Met		
Other				

\* This can include notes whether the course is basic or optional.

### 7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
1	CE101	Mathematics I	75	6.00
2	CE102	Engineering Mechanics I	75	6.00
3	CE103	Engineering Drawing I	30 30	5.00
4	CE104	Geology	30 30	6.00
5	CE105	Statistics I	30	3.00
6	UOM104	Democracy and Human Rights	30	2.00
7	UOM102	English Language 1	30	2.00
8	CE106	Mathematics II	75	7.00
9	CE107	Engineering Mechanics II	75	7.00
10	CE108	Engineering drawing II	30 30	6.00
11	UOM103	Computer 1	15 30	3.00
12	CE109	Statistics II	30	3.00
13	CE110	Electrical Engineering	30	2.00
14	UOM101	Arabic Language 1	30	2.00
15	CE201	Engineering Mathematics I	60	5.00
16	CE202	Mechanics of Materials I	60	5.00
17	CE203	Fluid mechanics	30 30	5.00
18	CE204	Concrete technology I	30 30	5.00
19	CE205	Engineering surveying I	30 45	6.00

20		UOM2050	The crimes of the Baath regime in Iraq	30	2.00
21		UOM2012	Arabic Language 2	30	2.00
22		CE206	Engineering Mathematics II	60	5.00
23		CE207	Mechanics of Materials II	75	6.00
24		CE208	Building construction and damages assessment	45	3.00
25		CE209	Concrete technology II	30 30	5.00
26		CE210	Engineering surveying II	30 45	6.00
27		UOM2032	Computer 2	15 30	3.00
28		UOM2022	English Language 2	30	2.00
29	The third year	CE301	Engineering analysis	30 30	3
30		CE302	Theory of structures I	75	3
31		CE303	Soil mechanics I	45 30	3
32		CE304	Reinforced concrete I	60	3
33		CE305	Highway Engineering I	45 30	3
34		CE306	Environmental engineering I	30 30	3
35		CE307	Engineering management	30	2
36		CE308	Hydrology	30	2
37		CE309	Numerical analysis	30 30	3
38		CE310	Theory of structures II	75	3
39		CE311	Soil mechanics II	45 30	3
40		CE312	Reinforced concrete II	60	3
41		CE313	Highway Engineering II	45 30	3
42		CE314	Environmental engineering II	30 30	3
43		CE315	Engineering economy	30	2
44		CE316	Hydraulic structures	30	2
45	fourth year		English language- Upper Intermediate	30	2
46		CIV401	Fundamentals of Steel Structures	30	2
47		CIV402	Reinforced Concrete Design	30	2
48		CIV403	Fundamentals of Foundation Engineering	45	3
49		CIV404	Graduation Project I	30	2
50		CIV405	Computer Applications	0 30	1
51		CIV406	Special Topics in Design of Reinforced Concrete Structures	30	2
52		CIV408	Special Topics in Geotechnical Engineering	30	2
53		CIV410	Flexible Pavement Design	30	2
54		ENGG425	Engineering Management	30	2

55		ENGG426	Engineering Economics	30	2
56		CIV412	Graduation Project I I	30	2
57		CIV413	Quantity Survey	30	2
58		CIV414	Sanitary and Environmental Engineering Construction Drawing Steel Structure Design  Analysis and Design of Deep Foundations Special Topics in Traffic Engineering Sanitary and Environmental Engineering	45	3
59		CIV415	Construction Drawing	30	1
60		CIV416	Steel Structures Design	30	2
61		CIV419	Analysis and Design of Deep Foundations	30	2
62		CIV421	Special Topics in Traffic Engineering	30	2

## 8. Expected learning outcomes of the program

### Knowledge

Learning Outcomes (A)	<p>A1. The ability to distinguish, identify, define, formulate, and solve engineering problems by applying engineering principles, science, and mathematics. GOs(i)</p> <p>A2. The ability to produce engineering designs which meet the desired needs within certain constraints by applying both analysis and synthesis in the design process. GOs (ii)</p> <p>A3. The ability to perceive the continual necessity for professional knowledge growth and how to find, assess, assemble, and apply it properly. GOs (vi)</p>
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### Skills

Learning Outcomes (B)	<p>B1. The ability to create and carry out proper measurements and tests with quality assurance, analyze and interpret the results, and utilize engineering judgment to make inferences. GOs (iii)</p> <p>B2. The ability to skillfully communicate orally with others and in writing with various managerial levels. GOs (iv)</p> <p>B3. The ability to perceive the continual necessity for professional knowledge growth and how to find, assess, assemble, and apply it properly. GOs (vi)</p>
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### Ethics

Learning Outcomes (C)	<p>C1. The ability to perceive ethical and professional responsibilities in engineering cases and make brilliant judgments considering the consequences in worldwide financial, ecological and societal considerations. GOs (v)</p> <p>C2. The ability to work adequately in teams, set up objectives, plan activities, meet due dates and manage risk and uncertainty. GOs (vii)</p>
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### 9. Teaching and Learning Strategies

Strategies and Teaching Methods Adopted for Program Implementation:	
1.	Delivering theoretical lectures using PowerPoint.
2.	Conducting laboratory experiments to apply concepts practically.
3.	Utilizing computer labs for training on software and applications.
4.	Presenting video lectures to support educational content.
5.	Assigning group projects to enhance collaborative work.

### 10. Evaluation methods

i. Midterm and Final Exams
ii. Quizzes
iii. Reports and Assignments

### 11. Faculty

#### Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecture
Professor	Civil Engineering	Highway Engineering		2	
		Geotechnical Engineering		2	

		Structural Engineering		1	
Assistant Professor	Civil Engineering	Highway Engineering		2	
		Geotechnical Engineering		3	
		Structural Engineering		8	
		Water		1	
	Mathematic	Functional Analysis		1	
Lecturer	Civil Engineering	Highway Engineering		2	
		Geotechnical Engineering		6	
		Structural Engineering		14	
Assistant Lecturer	Civil Engineering	Highway Engineering		1	
		Geotechnical Engineering		3	
		Structural Engineering		2	
	Management and Economics	Business Administration		1	
	Architecture Engineering	Architectural Design		1	

### Professional Development

#### Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

#### Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

## 12. Acceptance Criterion

The department's capacity is determined within the admission plan based on the department's

intake capacity. This is then sent to the college, the university, and the ministry for official approvals. After the central student admissions are issued by the Ministry of Higher Education and Scientific Research, students are accepted by the ministry based on their grades and their preferences. Afterwards, students apply to the college through the registration office in the Engineering College Deanship, submit the required official documents, and are distributed to the college's departments based on their capacity and the student's preferences, including the possibility of transferring from other departments to the department. Once the student is accepted into the Environmental Engineering Department, registration is completed, and the student begins attending classes in this department.

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

- College Website:

<https://uomosul.edu.iq/engineering/%d9%82%d8%b3%d9%85-%d8%a7%d9%84%d9%87%d9%86%d8%af%d8%b3%d8%a9-%d8%a7%d9%84%d9%85%d8%af%d9%86%d9%8a%d8%a9-3/>

- University Website:

<https://uomosul.edu.iq/>

### 14. Program Development Plan

Enhance the quality of education, raise graduate outcomes, and meet the required competencies, the department has adopted the Bologna system for education. This system includes the European Transfer and Accumulation System (ECTS).

### Program Skills Outline

#### Required program Learning outcomes

Year/L evel	Course Code	Course Name	Basic or optional	Knowledge			Skills			Ethics		
				A1	A2	A3	B1	B2	B3	C1	C2	C3
First	CE101	Mathematics I	Basic	*								
	CE102	Engineering Mechanics I	Basic	*								
	CE103	Engineering Drawing I	Basic	*								
	CE104	Geology	Basic	*	*							
	CE105	Statistics I	Basic	*								
	UOM104	Democracy and Human Rights	Basic							*		
	UOM102	English Language	Basic					*				
	CE106	Mathematics II	Basic	*								
	CE107	Engineering Mechanics II	Basic	*								
	CE108	Engineering Drawing II	Basic	*								
	UOM103	Computer Science	Basic							*		
	CE109	Statistics II	Basic	*								
	CE110	Electrical Engineering	Basic	*								
	UOM101	Arabic Language	Basic						*			

Second	CE201	Engineering Mathematics I	Basic	*									
	CE202	Mechanics of Materials I	Basic	*									
	CE203	Fluid mechanics	Basic	*									
	CE204	Concrete technology I	Basic	*			*						
	CE205	Engineering surveying I	Basic	*			*						
	UOM2050	The crimes of the Baath regime in Iraq	Basic							*			
	UOM2012	Arabic Language 2	Basic					*					
	CE206	Engineering Mathematics II	Basic	*									
	CE207	Mechanics of Materials II	Basic	*									
	CE208	Building construction and damages assessment	Basic	*							*		
	CE209	Concrete technology II	Basic	*			*		*			*	
	CE210	Engineering surveying II	Basic	*			*		*			*	
	UOM2032	Computer 2	Basic	*	*		*		*				
	UOM2022	English Language 2	Basic					*					

Third	CE301	Engineering analysis	Basic	*									
	CE302	Theory of structures I	Basic	*									
	CE303	Soil mechanics I	Basic	*			*			*			
	CE304	Reinforced concrete I	Basic	*	*								
	CE305	Highway Engineering I	Basic	*	*		*						
	CE306	Environmental engineering I	Basic	*			*						
	CE307	Engineering management	Basic	*						*			
	CE308	Hydrology	Basic	*									
	CE309	Numerical analysis	Basic	*									
	CE310	Theory of structures II	Basic	*									
	CE311	Soil mechanics II	Basic	*			*			*	*		
	CE312	Reinforced concrete II	Basic	*	*								
	CE313	Highway Engineering II	Basic	*	*		*				*		
	CE314	Environmental engineering II	Basic	*			*						
	CE315	Engineering economy	Basic	*						*			
	CE316	Hydraulic structures	Basic	*	*								

Fourth	-	English Language – Upper Intermediate	Basic					*					
	CIV401	Fundamentals of Steel Structures	Basic	*	*								
	CIV402	Reinforced Concrete Design	Basic	*	*								
	CIV403	Fundamentals of Foundation Engineering	Basic	*	*								
	CIV404	Graduation Project I	Basic	*	*	*	*	*	*	*	*		
	CIV405	Computer Applications	Basic						*				
	CIV406	Special Topics in Design of Reinforced Concrete Structures	Basic	*	*								
	CIV408	Special Topics in Geotechnical Engineering	Basic	*	*								
	CIV410	Flexible Pavement Design	Basic	*	*								
	ENGC425	Engineering Management	Basic	*							*		
	ENGC426	Engineering Economics	Basic	*							*		
	CIV413	Quantity Surveying	Basic	*							*		
	CIV414	Sanitary and Environmental Engineering	Basic	*	*								
	CIV415	Construction Drawing	Basic						*				
	CIV416	Steel Structure Design	Basic	*	*								
	CIV419	Analysis and Design of Deep Foundations	Basic	*	*								
	CIV421	Special Topics in Traffic Engineering	Basic	*									
CIV412	Graduation Project II	Basic	*	*	*	*	*	*	*	*	*		

**Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematics I	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE101		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI		
Administering Department	Civil eng. Dep.	College	College. Of engineering
Module Leader	Dr. Raghad A. Mustafa	e-mail	raghad.math@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D
Module Tutor		e-mail	
Peer Reviewer Name	Amina A Khaleel	e-mail	amina.alshumam@uomosul.edu.iq
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	

أ.م.د. براء جبار مجبور  
رئيس قسم الهندسة المدنية



<b>Module Aims, Learning Outcomes and Indicative Contents</b> أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. Provide the fundamental base for elementary mathematics.</li> <li>2. Use mathematical functions like trigonometric functions and application of derivatives to solve some Engineering problems.</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Basic 2D Curves drawing using shifting properties.</li> <li>2. Apply mathematic techniques to find the limits.</li> <li>3. Apply differential calculus and higher order to solve Engineering problems.</li> <li>4. Find velocity, acceleration with application of derivatives.</li> <li>5. Apply determinants properties and Crammer`s rule to solve Engineering problems.</li> <li>6. An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><u>Chapter 1</u> Prerequisites for calculus, coordinates and Graphs in the plane,. Slope and Equations for lines, functions and their graphs.Shifts, Cirrcles and parabolas , A review of trigonometric functions. [15 hrs]</p> <p><u>Chapter 2</u> Limits and continuity, introduction to limit, The sandwich theorem and <math>\frac{\sin \theta}{\theta}</math>, Limits involving infinity, continuous functions [15 hrs]</p> <p><u>Chapter 3</u> Derivatives, slopes, Tangent lines and derivatives. Differentiations Rules, Derivatives of Trigonometric functions. The chain rule, implicit differentiation and fractional powers [15 hrs]</p> <p><u>Chapter 4</u> Applications of derivatives, Related rates of change. Maxima, minima, curve sketching with <math>y'</math> and <math>y''</math>. Graphing Rational functions, Asymptotes, Optimization [15 hrs]</p> <p><u>Chapter 5</u> Types of Matrices, operations sum, multiplication by scalar, multiplication between two matrices, Determinants, The adjoin of Matrix, inverse of Matrix, Solving systems of linear equation using Matrices. [15 hrs]</p>

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

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	24% (24)	5, 10,11	LO #1, 2, 3
	<b>On line Assignments</b>	4	4% (4)	2, 4,6,8	LO # 1-4
	<b>Onsite Assignments</b>	4	4% (4)	3,5,7,9	LO # 1-4
	<b>Projects / Lab.</b>				
	<b>Report</b>	1	3%(3)	13	LO # 1-6
	<b>Seminars</b>	1	5%(5)		LO # 1-6
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	8	LO # 1-3
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

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<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Prerequisites for calculus, coordinates and Graphs in the plane.
<b>Week 2</b>	Slope and Equations for lines, functions and their graphs
<b>Week 3</b>	Shifts, Circles and parabolas , A review of trigonometric functions.
<b>Week 4</b>	Limits and continuity, introduction to limit.
<b>Week 5</b>	The sandwich theorem and $\frac{\sin \theta}{\theta}$
<b>Week 6</b>	Limits involving infinity, continuous functions
<b>Week 7</b>	Derivatives, slopes, Tangent lines and derivatives
<b>Week 8</b>	Differentiations Rules, Derivatives of Trigonometric functions
<b>Week 9</b>	The chain rule, implicit differentiation and fractional powers

<b>Week 10</b>	Applications of derivatives, Related rates of change.
<b>Week 11</b>	Maxima, minima, curve sketching with $y'$ and $y''$
<b>Week 12</b>	Graphing Rational functions, Asymptotes, Optimization
<b>Week 13</b>	Types of Matrices, operations sum, multiplication by scalar, multiplication between two matrices.
<b>Week 14</b>	Determinants, The adjoin of Matrix, inverse of Matrix
<b>Week 15</b>	Solving systems of linear equation using Matrices
<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>	Thomas' Calculus by Finney and Thomas.	Yes
<b>Recommended Texts</b>	<b>Calculus by Ron Larson, Bruce Edwards.</b>	no
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

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

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Mechanics I	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory	
Module Code	CE102	<input type="checkbox"/> Lecture	
ECTS Credits	6	<input type="checkbox"/> Lab	
SWL (hr/sem)	150	<input checked="" type="checkbox"/> Tutorial	
		<input type="checkbox"/> Practical	
		<input type="checkbox"/> Seminar	
Module Level	UGI	Semester of Delivery	1
Administering Department	Civil Eng. Dep.	College	College of Engineering
Module Leader	Nuha Hameedi Jasim	e-mail	<a href="mailto:nuhahamedi.nh@uomosul.edu.iq">nuhahamedi.nh@uomosul.edu.iq</a>
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc
Module Tutor	Nuha Hameedi Jasim	e-mail	<a href="mailto:nuhahamedi.nh@uomosul.edu.iq">nuhahamedi.nh@uomosul.edu.iq</a>
Peer Reviewer Name	Dr. Suhaib Y Al-darzi	e-mail	<a href="mailto:suhaib.qasim@uomosul.edu.iq">suhaib.qasim@uomosul.edu.iq</a>
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	Mechanic of Materials	Semester	

أ.م.د. نداء جبار محمود  
رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>This course aims to introduce the student to the system of units, types of forces, and types of quantities. How to analyze and compose forces. Finding the resultant force, Being able to calculate moments about different points and how to calculate the couple and transfer forces from one place to another. The student also learns about the effect of forces on static bodies and how to calculate reactions. And learn about the methods of analyzing some structures, such as trusses and frames.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Recognizing Newton's laws and the concept of force and the basic units used for it, and understanding how to analyze and compose forces.</li> <li>2. Classification of the type of forces, are they concurrent or parallel or are they nonconcurrent forces, and how to find the resultant of each type of force.</li> <li>3. Finding the moment of forces about any point and determine the couple, In addition to the transfer of forces from one point to another point.</li> <li>4. Applying equilibrium equations to problems and finding reactions that make bodies in equilibrium.</li> <li>5. Analysis of some engineering structures such as trusses and frames.</li> <li>6. An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> <li>7. An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> <li>8. An ability to acquire and apply new knowledge and using appropriate learning strategies.</li> <li>9. An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><b><u>Chapter 1 Introduction</u></b> Fundamental concept, Newtons laws, units of measurement, the international system of units, Scalars and Vectors [3 hrs]</p> <p><b><u>Chapter 2 Forces system and Resultant</u></b> Forces, composition and resolution of forces, Parallelogram law, moment, Couples, Force analysis into force and couple, the resultant of any system of forces [20hrs]</p> <p><b><u>Chapter 3 Equilibrium</u></b> Free-Body Diagrams, Equations of Equilibrium, Two- and Three-Force Members, The equilibrium of bodies subjected to non-concurrent forces [22hrs]</p> <p><b><u>Chapter 4 Truss and Frames</u></b></p> <p><b><u>Part A</u></b> Introduction, Trusses, Assumptions of simple trusses analysis, Zero-Force Members, Analysis of trusses by joint method, Analysis of trusses by section method. [18 hrs]</p> <p><b><u>Part B</u></b> Frames analysis. [12 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

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

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	5	24% (24)	4, 12	LO # 2, 3, 4 ,5 and 6
	<b>Assignments</b>	2	6% (6)	4, 12	LO # 2, 3 and 4
	<b>Calss work</b>	2	6% (6)		LO # 2, 3 and 4
	<b>Report</b>	1	4% (4)		LO # 2, 3 and 4-9
<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)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction, Basic concepts, vector and scalar quantities, units and their transformations.
Week 2	The law of parallelograms, forces and their components, Resolution and Composition of the forces
Week 3	The moments of forces, Couples
Week 4	The Resultant
Week 5	Determine the resultant location
Week 6	The concept of equilibrium and free body diagrams of the bodies
Week 7	Equilibrium equations for the concurrent force systems located in one plane
Week 8	Equilibrium of bodies subjected to two or three forces located in one plane
Week 9	Equilibrium of bodies subjected to non-concurrent forces and located in one plane
Week 10	Equilibrium of bodies subjected to non-concurrent forces and located in one plane
Week 11	Analysis of Trusses, introduction, Analysis of Trusses by joint method
Week 12	Analysis of Trusses by joint method & Analysis of Trusses by section method
Week 13	Analysis of Trusses by section method + fram analysis
Week 14	Frames analysis
Week 15	Frames analysis
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	“Engineering Mechanics-statics”, (1990), (Book language: Arabic)	Yes
Recommended Texts	Engineering Mechanics-statics”,(2016), R.C. Hibbeler ,14th edition.	Yes
Websites		

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Drawing I	Module Delivery	
Module Type	C	<input type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE102		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI		
Administering Department	Civil Eng. Dep.	College	College of Engineering
Module Leader	Ibtesam hazem/sura abd-alrazaaq	e-mail	ibtesam_alzubady_b-s@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	امينة احمد خليل	e-mail	amina.alshumam@uomosul.edu.iq
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	

أ.م.د. نداء جبار محجور  
رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To know about different types of lines &amp; use of different types of pencils in an Engineering Drawing</li><li>2. To know how to represents letters &amp; numbers in drawing sheet.</li><li>3. To know how to draw graphic geometry.</li><li>4. To know about different types of projection</li><li>5. To know projection of points ,straight lines, solids etc.</li><li>6. To know development of different types of surfaces.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1- Identify and use of different grades of pencils and other drafting instruments which are used in engineering field .</li><li>2- Draw free hand sketches of various kinds of objects.</li><li>3- Utilize various types of lines used in engineering drawing.</li><li>4- Read and apply different dimensioning methods on drawing of objects.</li><li>5- Use different types of scales and their utilization in reading and reproducing drawings of objects and maps.</li><li>6- Draw 2 - dimensional view of different objects viewed from different angles (orthographic views) .</li><li>7- Draw and interpret complete inner hidden details of an object which are otherwise not visible in normal view.</li><li>8- An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li><li>9- An ability to acquire and apply new knowledge and using appropriate learning strategies.</li><li>10- An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	Indicative content includes the following: Introduction about tools drawings and types of lines[4], Basic graphic &types of scales[6], graphic geometry , drawing polygons and ellipse ,reverse curve [12] , Orthographic Projection [18], Surface States[6] , Projection on Inclined Surfaces[8] , Tangent points [6].

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	15% (15)	4, 13	LO #3, 4, 5,6 and 7
	<b>H.W &amp; C.W</b>	12	24% (24)	1, 13	LO #3, 4, 5,6 and 7
	<b>Projects / Lab.</b>				
	<b>Report</b>	1	1%(1)		LO #3, 4, 5,6- 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	3 hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي	
	Material Covered
<b>Week 1</b>	Introduction to drawing instruments, materials, layout and sizes of drawing sheets and drawing boards.
<b>Week 2</b>	Different types of lines in Engineering drawing & Practice of vertical, horizontal and inclined lines.
<b>Week 3</b>	Basic Graphic
<b>Week 4</b>	Types of scales
<b>Week 5</b>	Graphic Geometry: how to draw to parallel, perpendicular & divide line.
<b>Week 6</b>	Geometrical figures such as triangles, rectangles, circles, ellipses and curves, hexagonal, pentagon with the help of drawing instruments
<b>Week 7</b>	Reverse Curve or Ogee Curve
<b>Week 8</b>	Theory of orthographic projections
<b>Week 9</b>	Types of projection
<b>Week 10</b>	Projection with parallel and perpendicular rays
<b>Week 11</b>	Three views of orthographic projection of different objects. (At least one sheet in 3rd angle)
<b>Week 12</b>	Surface States

<b>Week 13</b>	Projection of cylinders
<b>Week 14</b>	Projection on Inclined Surfaces
<b>Week 15</b>	Tangent points in projection
<b>Week 16</b>	Final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Teaching students to use tools in the studio
<b>Week 2</b>	Teaching students how to draw H.W. No. 1 and how to draw angles correctly
<b>Week 3</b>	Application to engineering operations by giving several homework questions
<b>Week 4</b>	Apply the drawing scale by giving a class work
<b>Week 5</b>	A practical application on drawing parallel and perpendicular lines and learning how to draw
<b>Week 6</b>	polygons, ellipse.
<b>Week 7</b>	Teach students to draw an reverse curves and give examples
<b>Week 8</b>	
<b>Week 9</b>	Practical application to various issues related to the theory of orthographic projection through
<b>Week 10</b>	class assignments and giving homework
<b>Week 11</b>	
<b>Week 12</b>	Solve examples of surface states
<b>Week 13</b>	Solve examples of projection of cylinders
<b>Week 14</b>	A practical application of projection on inclined surfaces and teaching the student how to
<b>Week 15</b>	find points of tangent in the projections

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Engineering Drawing and Graphic Technology, By French & Vierk , Twelve edition	yes
<b>Recommended Texts</b>	Technical drawing with engineering	No
<b>Websites</b>		

### Grading Scheme

مخطط الدرجات

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

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Geology	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE104		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI		
Administering Department	Civil Eng. Dep.	College	College of Engineering
Module Leader	Dr. Khawlah Ahmad	e-mail	Khawlah.ahmad@uomosul.edu.iq
Module Leader's Acad. Title	Ass. Prof	Module Leader's Qualification	Ph.D
Module Tutor			
Peer Reviewer Name	امينة احمد خليل	e-mail	amina.alshumam@uomosul.edu.iq
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	

أ.م.د. براء جبار محمود  
رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>The Module aims including the following:</p> <ol style="list-style-type: none"> <li>1 Importance of engineering geology for civil engineer</li> <li>2 Learning types of minerals and their engineering properties, in addition to clay minerals which have great importance in civil engineering</li> <li>3 Understand basic relation in soil and rocks</li> <li>4 Effect of geological structures on engineering facilities built above and under the earth surface.</li> <li>5 Learning methods of drawing and reading geological, topographic and contour maps, and calculating the amounts of backfill and cut.</li> </ol>								
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">1</td> <td>Learning types of minerals and their engineering properties, in addition to clay minerals which have great importance in civil engineering</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Understand basic relation in soil and rocks</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Effect of geological structures on engineering facilities built above and under the earth surface.</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Learning methods of drawing and reading geological, topographic and contour maps, and calculating the amounts of backfill and cut.</td> </tr> </table> <ol style="list-style-type: none"> <li>5. An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> <li>6. An ability to acquire and apply new knowledge and using appropriate learning strategies.</li> <li>7. An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li> </ol>	1	Learning types of minerals and their engineering properties, in addition to clay minerals which have great importance in civil engineering	2	Understand basic relation in soil and rocks	3	Effect of geological structures on engineering facilities built above and under the earth surface.	4	Learning methods of drawing and reading geological, topographic and contour maps, and calculating the amounts of backfill and cut.
1	Learning types of minerals and their engineering properties, in addition to clay minerals which have great importance in civil engineering								
2	Understand basic relation in soil and rocks								
3	Effect of geological structures on engineering facilities built above and under the earth surface.								
4	Learning methods of drawing and reading geological, topographic and contour maps, and calculating the amounts of backfill and cut.								
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"> <li>1- Definition of engineering geology</li> <li>2- The relationship between geology and civil engineering [4]</li> <li>3- Definition of natural minerals and their engineering properties Clay Mineralogy [4]</li> <li>4- Introduction to rocks and their types in the Earth's crust</li> <li>5- Definition of sedimentary, igneous and metamorphic rocks, their types and geological characteristics [4]</li> <li>6- Weathering, erosion and soil formation [4]</li> <li>7- Geological structures - folds, faults and joints in rocks and their impact on engineering structures [4]</li> <li>8- Engineering properties of rocks - physical and mechanical [4]</li> <li>9- Midterm examination [4]</li> <li>10- Topographical and geological maps and the purpose of their study [4]</li> <li>11- Soil engineering properties - physical, mechanical, and hydraulic properties of the soil [4]</li> <li>12- Ground water - storage and movement of ground water, factors affecting groundwater movement and ground water quality [4]</li> </ol>								

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>The main strategy that will be adopted in delivering this module is to:</p> <ol style="list-style-type: none"> <li>1 Importance of engineering geology for civil engineer</li> <li>2 Learning types of minerals and their engineering properties, in addition to clay minerals which have great importance in civil engineering</li> <li>3 Understand basic relation in soil and rocks</li> <li>4 Effect of geological structures on engineering facilities built above and under the earth surface.</li> <li>5 Learning methods of drawing and reading geological, topographic and contour maps, and calculating the amounts of backfill and cut.</li> </ol>
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	87	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	4	20% (20)		LO #1, 2, 3 and 4
	<b>Assignments</b>	3	10% (10)		LO # 3 and 4
	<b>Projects / Lab.</b>				
	<b>Report</b>	2	10% (10)		LO # 1-7
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	3 hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Definition of engineering geology
Week 2	Definition of engineering geology The relationship between geology and civil engineering
Week 3	Definition of natural minerals and their engineering properties Clay Mineralogy
Week 4	Introduction to rocks and their types in the Earth's crust Definition of sedimentary, igneous and metamorphic rocks, their types and geological characteristics
Week 5	Introduction to rocks and their types in the Earth's crust Definition of sedimentary, igneous and metamorphic rocks, their types and geological characteristics
Week 6	Weathering, erosion and soil formation
Week 7	Geological structures - folds, faults and joints in rocks and their impact on engineering structures
Week 8	Engineering properties of rocks - physical and mechanical
Week 9	Engineering properties of rocks - physical and mechanical
Week 10	Midterm examination
Week 11	Topographical and geological maps and the purpose of their study
Week 12	Soil engineering properties - physical, mechanical, and hydraulic properties of the soil
Week 13	Soil engineering properties - physical, mechanical, and hydraulic properties of the soil
Week 14	Ground water - storage and movement of ground water,
Week 15	factors affecting groundwater movement and ground water qualityR
Week 16	Preparatory week before the final Exam

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Definition of laboratory apparatus
Week 2	Types and properties of minerals
Week 3	Study of the types and composition of igneous rocks
Week 4	Study of the types and composition of metamorphic rocks
Week 5	Study of the types and composition of sedimentary rocks
Week 6	Midterm examination
Week 7	Some tests on rocks
Week 8	Topographical and geological maps drawings
Week 9	Preparatory week before the final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	Basic of geology for engineers	Yes
<b>Recommended Texts</b>	Engineering Geology Soil mechanic and foundation engineer	No
<b>Websites</b>		

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (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 (0 - 49)</b>	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Statistics I	Module Delivery	
Module Type	B	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE105		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGI		
Administering Department	Civil Eng Dep	College	College of Engineering
Module Leader	Mohammed Ghanim	e-mail	Mohammed_g72@uomosul.edu.iq
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	MSc
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	امينة احمد خليل	e-mail	amina.alshumam@uomosul.edu.iq
Scientific Committee Approval Date	1-9-2025	Version Number	1.1

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

أ.م.د. براء جبار محمود  
رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. Introduce the student to collecting and presenting statistical data</li> <li>2. Classifying and tabulating the engineering information in a manner consistent with the data and the field of academic work</li> <li>3. an ability to conduct experiments, analyze, and interpret data</li> <li>4. The ability to identify and solve engineering problems.</li> <li>5. Take the appropriate decision through scientific analysis of information</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1 Develop a clear and concise description of the problem.</li> <li>2 Identify, at least tentatively, the important factors that affect this problem or that may play a role in its solution.</li> <li>3 Propose a model for the problem, using scientific or engineering knowledge of the phenomenon being studied. State any limitations or assumptions of the model.</li> <li>4 Conduct appropriate experiments and collect data to test or validate the tentative model or conclusions made</li> <li>5 Refine the model on the basis of the observed data.</li> <li>6 Manipulate the model to assist in developing a solution to the problem.</li> <li>7 Conduct an appropriate experiment to confirm that the proposed solution to the problem is both effective and efficient.</li> <li>8 Draw conclusions or make recommendations based on the problem solution.</li> <li>9 An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ul style="list-style-type: none"> <li>- Introduction: nature of statistics. [8 hr]</li> <li>- The statistical terms: nature of statistical data, Distributions, Measures of central location, Measures of variation or dispersion. [12 hr]</li> <li>- Elementary probability theory, Probability distribution, Discrete probability distribution. [14 hr]</li> <li>- Continuous probability distribution, Sampling theory, Estimation theory, Statistical decision theory, Simple regression and correlation. [14 hr]</li> </ul>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	75		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	24% (24)	5, 10,1	LO #1, 2-9
	<b>Assignments</b>	6	12% (12)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects / Lab.</b>				
	<b>Report</b>	1	4% (4)		LO # 3, 4, 6 and 7
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	General Introduction to Engineering Statistics
<b>Week 2</b>	Data Presentation: Tabular presentation /Creating Frequency Table.
<b>Week 3</b>	Graphical presentation (Histogram, Frequency Polygon).
<b>Week 4</b>	Measures of central tendency (Arithmetic mean, median and mode, the relation between the central tendency measures for unimodal distributions
<b>Week 5</b>	Measurement of dispersion and variation, absolute dispersion (ungrouped data)
<b>Week 6</b>	Measurement of dispersion and variation, absolute dispersion (grouped data)
<b>Week 7</b>	Measurement of dispersion and variation, absolute dispersion (grouped data)
<b>Week 8</b>	<b>Probability:</b> Basic Concepts of Probability Theory
<b>Week 9</b>	Rule of Probability Additional rule Two events, mutually and non-mutually events
<b>Week 10</b>	Three events, mutually and non-mutually events
<b>Week 11</b>	Multiplication rule, Tow events, (independent and dependent events)

<b>Week 12</b>	The definition of conditional probability and their properties. Bayes' theorem
<b>Week 13</b>	The definition and classification of random variable (Discrete and Continuous), type of discrete distributions
<b>Week 14</b>	Discrete probability distributions (Binomial distribution)
<b>Week 15</b>	Discrete probability distributions Poisson distribution).
<b>Week 16</b>	Final Exam

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	مدخل الى الاحصاء، د. خاشع الراوي	Yes
<b>Recommended Texts</b>	Introduction to Probability and Statistics for Engineers, Holický, Milan	No
<b>Websites</b>		

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (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 (0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language	Module Delivery	
Module Type	S	<input type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	UOM1021		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UGI	Semester of Delivery	1
Administering Department	Civil Eng. Dep.	College	College of Engineering
Module Leader	Rahma. E. AbdulKareem	e-mail	Rahma.aithar@uomosul.edu.iq
Module Leader's Acad. Title	Ass. Lecturer	Module Leader's Qualification	M. Sc
Module Tutor		e-mail	
Peer Reviewer Name	امينة احمد خليل	e-mail	amina.alshumam@uomosul.edu.iq
Scientific Committee Approval Date	1-9-2025	Version Number	1.1

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

أ.م.د. براء جبار محمود  
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## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>The objective of the English class is to develop vocabulary and speaking skills, focusing on personal introductions and basic conversation topics. Students will learn to express personal information, talk about their world, discuss family and friends, describe their preferences, and communicate about sports, food, and drinks. The class aims to enhance reading and listening skills through engaging texts and audio materials while improving writing skills through various writing tasks. Additionally, students will practice proper pronunciation and expand their vocabulary by learning adjectives, question words, and basic language structures. By the end of the course, students will have gained confidence in using English for everyday communication, improved their language proficiency in speaking, reading, writing, and listening, and developed a broader range of vocabulary.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>The outcome of the English class is</p> <ol style="list-style-type: none"><li>1. Developed a strong vocabulary and improved speaking skills for basic conversation and personal introductions.</li><li>2. Acquired knowledge about different countries, their cultures, and improved reading and speaking abilities to discuss them.</li><li>3. Gained proficiency in using personal pronouns (he/she/they) and possessive pronouns (his/her/their).</li><li>4. Enhanced reading and listening skills by understanding and responding to texts on topics such as jobs, personal information, and social expressions.</li><li>5. Strengthened reading and writing skills through activities focused on family, possessive forms, and the alphabet.</li><li>6. Expanded vocabulary related to sports, food, drinks, languages, nationalities, numbers, and prices, while improving pronunciation.</li><li>7. Developed the ability to ask questions using question words, use pronouns (me/him/us/them), and express preferences using adjectives.</li><li>8. Improved overall vocabulary and communication skills in both speaking and listening through various activities and exercises.</li><li>9. An ability to acquire and apply new knowledge and using appropriate learning strategies.</li><li>10. An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A - Reading and Writing:</u></p> <p><u>-Developing reading comprehension skills through texts and passages related to various topics.</u></p> <p><u>-Practicing writing skills through activities such as summarizing, paragraph writing, and essay writing. [30 hrs.]</u></p> <p><u>Part B -Vocabulary:</u></p> <p>-Building vocabulary related to different themes and contexts, including greetings, personal information, occupations, sports, food, drinks, etc.</p> <p>-Expanding word knowledge through exercises, word associations, and contextual usage [10 hrs]</p> <p><u>Part C -Listening and Speaking:</u></p> <p>-Enhancing listening skills through audio materials, dialogues, and conversations.</p> <p>-Engaging in speaking activities to improve fluency, pronunciation, and</p>

	communication skills. -Participating in discussions, role-plays, and presentations to develop oral proficiency. [7 hrs]
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	50		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	18% (18)	5, 10	LO #3, 4, 5, and 6
	<b>Assignments</b>	3	18% (18)	2, 12	LO #1, 2, 5, and 6
	<b>Projects / Lab.</b>				
	<b>Report</b>	1	4%(4)		LO # 1-10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	3 hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

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

<b>Week 1</b>	Unit 1- Hello.
<b>Week 2</b>	Vocabulary and speaking.
<b>Week 3</b>	Unit 2- your world. Countries • he/she/they, his/her • Where's he from?
<b>Week 4</b>	Reading and speaking.
<b>Week 5</b>	Unit 3- All about you. Jobs • am/are/is • Negatives and questions • Personal information • Social expressions.
<b>Week 6</b>	Reading and listening.
<b>Week 7</b>	<b>Mid-term Exam</b>
<b>Week 8</b>	Unit 4- Family and friends. our/their • Possessive 's • The family • has/have • The alphabet
<b>Week 9</b>	Reading and Writing.
<b>Week 10</b>	Unit 5- The way I live. Sports/ Food/ Drinks • Present Simple - I/you/we/they • a/ an Languages and nationalities • Numbers and prices.
<b>Week 11</b>	Vocabulary and Pronunciation.
<b>Week 12</b>	Unit 6- My favorites. Question words • me/him/us/them • this/that Adjectives • Can I ... ?
<b>Week 13</b>	Vocabulary -Adjectives
<b>Week 14</b>	Reading and Writing
<b>Week 15</b>	Speaking and Listening.
<b>Week 16</b>	<b>A 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?
Required Texts	New headway, beginner student's book. John and Liz Soars.	Yes
Recommended Texts		
Websites		

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

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematics II	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE106		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	UGI		
Administering Department	Civil engineering	College	College of Engineering
Module Leader	Raghad A. Mustafa	e-mail	raghad.math@uomosul.edu.iq
Module Leader's Acad. Title	Lecture	Module Leader's Qualification	M.SC.
Module Tutor		e-mail	
Peer Reviewer Name	Amina A Khaleel	e-mail	amina.alshumam@uomosul.edu.iq
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	

أ.د. رهاة جبار محمود  
رئيس قسم الهندسة المدنية



<b>Module Aims, Learning Outcomes and Indicative Contents</b> أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. Provide the fundamental base for elementary mathematics about integration.</li> <li>2. Use mathematical integration to find the area, length of the curve and volume.</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Integral some functions.</li> <li>2. Apply integral information to find the area between two curves.</li> <li>3. Apply integral information to find the volume generated by revolving the area.</li> <li>4. Know the inverse functions.</li> <li>5. Apply the technique of integration to solve integral problems.</li> <li>6. An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> <li>7. An ability to acquire and apply new knowledge and using appropriate learning strategies.</li> <li>8. An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><u>Chapter 1</u> Integrating , finding the area with x-axis, Definite integrals, indefinite integrals [10 hrs]</p> <p><u>Chapter 2</u> Application of definite integrals, Areas between Curves, Volumes of solids of revolution, Disks and Washers. Cylindrical shells, length of curves in the plane, Areas of surfaces of Revolution. [20 hrs]</p> <p><u>Chapter 3</u> The calculus of transcended functions, inverse functions, <math>\ln x</math>, <math>e^x</math> and logarithmic differentiation, General exponential and logarithmic function. Indeterminate forms and l'Hopital's Rules, The inverse of trigonometric functions. [20 hrs]</p> <p><u>Chapter 4</u> Techniques of integration, basic integration formulas, Integration by parts, Trigonometric integrals, Trigonometric substitution, Rational functions and partial fractions [25 hrs]</p>

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

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	97	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	175		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	30% (30)	5, 10	LO #1, 2, 3-8
	<b>Online assignments</b>	1	4% (4)	2, 12	LO # 1-8
	<b>Onsite assignments</b>	1	4% (4)	2, 12	LO # 1-8
	<b>Report</b>	1	2% (2)	2, 12	LO # 1-8
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	8	LO # 1-3
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Integrating , finding the area with x-axis
<b>Week 2</b>	Definite integrals, indefinite integrals
<b>Week 3</b>	Application of definite integrals, Areas between Curves
<b>Week 4</b>	Volumes of solids of revolution, Disks and Washers
<b>Week 5</b>	Cylindrical shells,
<b>Week 6</b>	length of curves in the plane
<b>Week 7</b>	Areas of surfaces of Revolution
<b>Week 8</b>	The calculus of transcended functions, inverse functions,
<b>Week 9</b>	$\ln x$ , $e^x$ and logarithmic differentiation

<b>Week 10</b>	General exponential and logarithmic function
<b>Week 11</b>	Indeterminate forms and l'Hopital's Rules, The inverse of trigonometric functions
<b>Week 12</b>	Techniques of integration, basic integration formulas
<b>Week 13</b>	Integration by parts
<b>Week 14</b>	Trigonometric integrals, Trigonometric substitution
<b>Week 15</b>	Rational functions and partial fractions
<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>	Thomas' Calculus by Finney and Thomas.	Yes
<b>Recommended Texts</b>	<b>Calculus by Ron Larson, Bruce Edwards.</b>	no
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (50 - 100)	<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</b> (0 – 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Mechanics II	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory	
Module Code	CE107	<input type="checkbox"/> Lecture	
ECTS Credits	7	<input type="checkbox"/> Lab	
SWL (hr/sem)	175	<input checked="" type="checkbox"/> Tutorial	
		<input type="checkbox"/> Practical	
		<input type="checkbox"/> Seminar	
Module Level	UGI	Semester of Delivery	2
Administering Department	Civil engineering	College	College of engineering
Module Leader	Nuha Hameedi Jasim Dr. Mohammed S. Al Jawahery	e-mail	<a href="mailto:nuhahamedi.nh@uomosul.edu.iq">nuhahamedi.nh@uomosul.edu.iq</a> <a href="mailto:mohammed.aljawahery@uomosul.edu.iq">mohammed.aljawahery@uomosul.edu.iq</a>
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc
Module Tutor	Nuha Hameedi Jasim Dr. Mohammed S. Al Jawahery	e-mail	<a href="mailto:nuhahamedi.nh@uomosul.edu.iq">nuhahamedi.nh@uomosul.edu.iq</a> <a href="mailto:mohammed.aljawahery@uomosul.edu.iq">mohammed.aljawahery@uomosul.edu.iq</a>
Peer Reviewer Name	Dr. Suhaib Y Al-darzi	e-mail	<a href="mailto:suhaib.qasim@uomosul.edu.iq">suhaib.qasim@uomosul.edu.iq</a>
Scientific Committee Approval Date	1-9-2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module	Mechanic of Materials	Semester	

أ.م.د. بناء جبار محمود  
رئيس قسم الهندسة المدنية



<b>Module Aims, Learning Outcomes and Indicative Contents</b> أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
<b>Module Aims</b> أهداف المادة الدراسية	This course aims to introduce the student to Friction with application examples, concept of centroid and center of gravities, concept of moment of inertia. In additions to Introduction to dynamic's engineering mechanics.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Friction, with application examples.</li> <li>2. Concept of Centroid and center of gravities.</li> <li>3. Concept of Moment of inertia.</li> <li>4. Introduction to dynamic's engineering mechanics.</li> <li>5. An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> <li>6. An ability to acquire and apply new knowledge and using appropriate learning strategies.</li> <li>7. An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><b><u>Chapter 1 Introduction</u></b> Fundamental concept, Reviewing for Engineering Mechanics-I with application examples [5 hrs].</p> <p><b><u>Chapter 2 Friction</u></b> Introduction, Characteristics of Dry Friction, with application examples [15 hrs]</p> <p><b><u>Chapter 3 Centroids and Center of Gravities</u></b> <u>Part A:</u> Introduction, Centroid and center of gravities by integration. [10 hrs] <u>Part B:</u> Centroids for combined areas. [10 hrs]</p> <p><b><u>Chapter 4 Moment of Inertia</u></b> <u>Part A:</u> Concept of Moment of inertia. [10 hrs] <u>Part B:</u> Moment of inertia for combined areas. [10 hrs] <u>Part C:</u> Moment of inertia for an area about inclined axes. [10 hrs]</p> <p><b><u>Chapter 5 Dynamics</u></b> Introduction to dynamic (basics, definitions and concepts of projectiles). [20 hrs]</p>
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	97	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	175		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		<b>Time/Number</b>	<b>Weight (Marks)</b>	<b>Week Due</b>	<b>Relevant Learning Outcome</b>
<b>Formative assessment</b>	<b>Quizzes</b>	5	24% (24)	4, 12	LO # 2, 3, 4 ,5 and 6
	<b>Assignments</b>	2	6% (6)	4, 12	LO # 2, 3 and 4
	<b>Class work</b>	2	6% (6)		LO # 2, 3 and 4
	<b>Report</b>	1	4% (4)		LO # 2, 3 and 4-9
<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> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Introduction, Basic concepts, Reviewing for Engineering Mechanics-I with application examples
<b>Week 2</b>	Concepts of friction (definitions and application examples)
<b>Week 3</b>	Problems
<b>Week 4</b>	Concept of centroids and center of gravities
<b>Week 5</b>	Centroid by integration

<b>Week 6</b>	Centroids for combined areas
<b>Week 7</b>	Problems
<b>Week 8</b>	Concept of Moment of inertia
<b>Week 9</b>	Moment of inertia for combined areas
<b>Week 10</b>	Product of inertia of an area
<b>Week 11</b>	Problems
<b>Week 12</b>	Moment of inertia for an area about inclined axes
<b>Week 13</b>	Problems
<b>Week 14</b>	Introduction to dynamic (basics, definitions and concepts of projectiles)
<b>Week 15</b>	Problems
<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 Mechanics-Dynamic”, (1990), (Book language: Arabic)	Yes
<b>Recommended Texts</b>	Engineering Mechanics-Dynamic”, (2010), R.C. Hibbeler ,12 edition. (Book language: English)	Yes
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (50 - 100)	<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</b> (0 - 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Drawing II	Module Delivery	
Module Type	C	<input type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE108		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI	Semester of Delivery	2
Administering Department	Civil engineering	College	College of Engineering
Module Leader	Ibtesam hazem/sura abd-alrazaaq	e-mail	ibtesam_alzubady_b-s@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	امينة احمد خليل	e-mail	amina.alshumam@uomosul.edu.iq
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	

أ.م.د. سناء جبار مجبور  
رئيس قسم الهندسة المدنية



<b>Module Aims, Learning Outcomes and Indicative Contents</b> أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. To know about isometric projection.</li> <li>2. Different lines used for representation of different Engineering Sections.</li> <li>3. To know how to estimate missing view.</li> <li>4. Qualifying students to use AutoCAD for engineering drawings efficiently in order to help them in their designs &amp; projects.</li> </ol>		
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1- Identify and use of different grades of pencils and other drafting instruments which are used in engineering field .</li> <li>2- Draw free hand sketches of various kinds of objects.</li> <li>3- Generate isometric (3D) drawing from different 2D (orthographic) views/sketches.</li> <li>4- Identify conventions for different engineering materials, symbols, sections of regular objects and general fittings used in Civil and Electrical household appliances.</li> <li>5- Find the missing views.</li> <li>6- students will be able to use Autocad commands to make drawings, create annotations, create &amp; insert symbols, dimension a drawing, create blocks, and plot drawings with certain scales.</li> <li>7- An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> <li>8- An ability to acquire and apply new knowledge and using appropriate learning strategies.</li> <li>9- An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li> </ol>		
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following:</p> <p>Introduction in in Isometric drawing then explain its type , Circles Isometric [10] , Inclined Surfaces in Isometric [4] , Missing View [6] , Sectional Views, Parts not sectioned [10] , Autocad commands [30].</p>		
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم			
<b>Strategies</b>	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.</p>		
<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4

<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	1	12% (12)	4, 13	LO #3, 4, 5 and 6
	<b>H.W &amp;</b>	1	8% (8)	1, 13	LO #3, 4, 5 and 6
	<b>Autocad</b>	1	10%(10)	8,15	LO #6
	<b>C.W</b>	1	10%		
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-6
	<b>Final Exam</b>	3 hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي	
	Material Covered
<b>Week 1</b>	Pictorial Drawing- Isometric drawing
<b>Week 2</b>	Circles Isometric
<b>Week 3</b>	Inclined Surfaces in Isometric
<b>Week 4</b>	Missing View
<b>Week 5</b>	Dimensions and Notes
<b>Week 6</b>	Sectional Views
<b>Week 7</b>	Parts not sectioned
<b>Week 8</b>	<b>Getting started:</b> 1- Start a new drawing. 2- User Interface. 3- Drafting settings I (Snap, Rectangular & Isometric grid). 4- Limits. 5- Units. 6- Absolute & Relative coordinate system. 7- Ortho.
<b>Week 9</b>	<b>Drawing I</b> 1- 2- Line, Arc, Circle, Ellipse, Polygon, Rectangle,
<b>Week 10</b>	<b>Drawing II, View.</b> 1- Zoom, Pan, 2- Drafting settings II.(Osnap, Polar snap). 3- Pline, Pedit. 4- Erase. 5- Selecting objects. 6- Ltype, Ltscale. <b>awing II, View.</b> 1- Zoom, Pan, 2- Drafting settings II.(Osnap, Polar snap). 3- Pline, Pedit. 4- Erase. 5- Selecting objects. 6- Ltype, Ltscale.
<b>Week 11</b>	<b>Modify I, Drawing III:</b> 1-Copy, Rotate, Move, Scale, Stretch. 2- Undo, U, Redo. 3-, Lweight. 4- Divide, Measure.5- Point (DDPTYPE).
<b>Week 12</b>	<b>Layers, Modify II:</b> 1- Working with Layers. 2- Properties (Mo, Ch). 4- Working with Grips.

<b>Week 13</b>	<b>Modify III.</b> 1- Array, Offset, Fillet, Chamfer, Trim, Extend, Lengthen, Mirror,Break, Join, Explode.
<b>Week 14</b>	<b>Annotation I, Modify IV, Inquiry:</b> 1-Style, Text, Mtext, Ddedit,. 2- ID, Dist, Area, Massprop
<b>Week 15</b>	<b>Annotation II:</b> 1- Dimensions & Leaders.
<b>Week 16</b>	Final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Engineering Drawing and Graphic Technology, By French & Vierk , Twelve edition Autodesk Autocad 2020 online Help	yes
<b>Recommended Texts</b>	Technical drawing with engineering	No
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (50 - 100)	<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</b> (0 – 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer 1		Module Delivery
Module Type	B		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOM 1031		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	1	Semester of Delivery	
Administering Department	Civil Eng. Dept.	College	College of Engineering
Module Leader	Rowida Salih	e-mail	<a href="mailto:Rowida.alkhafagi@uomosul.edu.iq">Rowida.alkhafagi@uomosul.edu.iq</a>
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	M.Sc
Module Tutor		e-mail	
Peer Reviewer Name	Amina A Khaleel		<a href="mailto:amina.alshumam@uomosul.edu.iq">amina.alshumam@uomosul.edu.iq</a>
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	

أ.م.د. ابتداء جبار محمد  
رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	The Module aim is to prepare student to deal with computers. In addition to, teach the student the fundamentals of computers and its components. Furthermore, learning how to use two of Microsoft Office applications (Word and Excel).
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>It is expected from the student who passes this module learn the following topics:</p> <ol style="list-style-type: none"><li>1. Computers and Operating System</li><li>2. Software and Hardware Interaction</li><li>3. Windows File Management</li><li>4. Operating System Customization</li><li>5. Computer Hardware</li><li>6. Monthly LAB Exam</li><li>7. Exploring Microsoft Office 2013</li><li>8. Getting Started with Word Essentials</li><li>9. Editing and Formatting Documents</li><li>10. Getting Started with Excel Essentials</li><li>11. Organizing and Enhancing Worksheets</li><li>12. Creating Formulas and Charting Data</li><li>13. An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li><li>14. An ability to acquire and apply new knowledge and using appropriate learning strategies.</li><li>15. An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Computers and Operating System [6 hr] Software and Hardware Interaction [6 hr] Windows File Management [3 hr] Operating System Customization [3 hr] Computer Hardware [6 hr] Exploring Microsoft Office 2013 [3 hr] Getting Started with Word Essentials [3 hr] Editing and Formatting Documents [3 hr] Getting Started with Excel Essentials [3 hr] Organizing and Enhancing Worksheets [3 hr] Creating Formulas and Charting Data [3 hr]</p>

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' participation in the Lab activities, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, laboratory and by considering type of external search involving some of computer technology that are interesting to the students.
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## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعاً

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	48	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	3
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	75		

## Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	1	10% (10)	4, 11	LO #Q1: 1-2, Q2: 7-9
	<b>Assignments</b>	1	5% (5)	3, 10	LO #A1: 1-2, A2: 7-9
	<b>Lab.</b>	1	20% (20)	Continuous	All
	<b>Report</b>	1	5% (5)	14	All
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	9	LO # 1-5
	<b>Final Exam</b>	3hr	50% (50)		
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Computers and Operating System
<b>Week 2</b>	Computers and Operating System (Continued)
<b>Week 3</b>	Software and Hardware Interaction
<b>Week 4</b>	Software and Hardware Interaction (Continued)
<b>Week 5</b>	Windows File Management
<b>Week 6</b>	Operating System Customization
<b>Week 7</b>	Computer Hardware
<b>Week 8</b>	Computer Hardware (Continued)
<b>Week 9</b>	Monthly Exam
<b>Week 10</b>	Exploring Microsoft Office 2013
<b>Week 11</b>	Getting Started with Word Essentials
<b>Week 12</b>	Editing and Formatting Documents
<b>Week 13</b>	Getting Started with Excel Essentials

<b>Week 14</b>	Organizing and Enhancing Worksheets
<b>Week 15</b>	Creating Formulas and Charting Data
<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, 2</b>	Computers and Operating System
<b>Week 3, 4</b>	Software and Hardware Interaction
<b>Week 5</b>	Windows File Management
<b>Week 6</b>	Operating System Customization
<b>Week 7, 8</b>	Computer Hardware
<b>Week 9</b>	Monthly LAB Exam
<b>Week 10</b>	Exploring Microsoft Office 2013
<b>Week 11</b>	Getting Started with Word Essentials
<b>Week 12</b>	Editing and Formatting Documents
<b>Week 13</b>	Getting Started with Excel Essentials
<b>Week 14</b>	Organizing and Enhancing Worksheets
<b>Week 15</b>	Creating Formulas and Charting Data

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	2015 Computer Literacy BASICS: A Comprehensive Guide to IC3 Connie Morrison, Dolores Wells, Lisa Ruffolo Cengage Learning. ISBN: 128576658X	Available as PDF
<b>Recommended Texts</b>	IC3 GS5 Certification Guide Using Windows 10 & Office 2016	Available as PDF
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (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 (0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Statistics II	Module Delivery	
Module Type	S	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE109		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGI		
Administering Department	Civil engineering	College	College of Engineering
Module Leader	Noora Suhail	e-mail	
Module Leader's Acad. Title	Assistant lecture	Module Leader's Qualification	MSc
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	امينة احمد خليل	e-mail	amina.alshumam@uomosul.edu.iq
Scientific Committee Approval Date	1-9-2025	Version Number	1.1

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

  
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## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Introduce the student to collecting and presenting statistical data</li> <li>2. Classifying and tabular the engineering information in a manner consistent with the data and the field of academic work</li> <li>3. an ability to conduct experiments, analyze and interpret data</li> <li>4. The ability to identify and solve engineering problems.</li> <li>5. Take the appropriate decision through scientific analysis of information</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1 Develop a clear and concise description of the problem.</li> <li>2 Identify, at least tentatively, the important factors that affect this problem or that may play a role in its solution.</li> <li>3 Propose a model for the problem, using scientific or engineering knowledge of the phenomenon being studied. State any limitations or assumptions of the model.</li> <li>4 Conduct appropriate experiments and collect data to test or validate the tentative model or conclusions made</li> <li>5 Refine the model on the basis of the observed data.</li> <li>6 Manipulate the model to assist in developing a solution to the problem.</li> <li>7 Conduct an appropriate experiment to confirm that the proposed solution to the problem is both effective and efficient.</li> <li>8 Draw conclusions or make recommendations based on the problem solution.</li> <li>9 An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> <li>10 An ability to acquire and apply new knowledge and using appropriate learning strategies.</li> <li>11 An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<ul style="list-style-type: none"> <li>- Introduction: nature of statistics. [8 hr]</li> <li>- The statistical terms: nature of statistical data, Distributions, Measures of central location, Measures of variation or dispersion. [12 hr]</li> <li>- Elementary probability theory, Probability distribution , Discrete probability distribution . [14 hr]</li> <li>- Continues probability distribution, Sampling theory, Estimation theory, Statistical decision theory, Simple regression and correlation. [14 hr]</li> </ul>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<p><b>Strategies</b></p>	<p>Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.</p>
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	75		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	24% (8)	5, 10	LO #1, 2, 10 and 11
	<b>Assignments</b>	2	8% (4)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects / Lab.</b>	1	4% (4)		
	<b>Report</b>	1	4% (4)		
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Continuous Probability Distributions (normal distribution), Properties
<b>Week 2</b>	Rules to obtain the probability under the Normal Curve
<b>Week 3</b>	normally distributed population with a mean and variance into (N) samples
<b>Week 4</b>	Test of hypothesis: Types of errors in hypothesis testing. The steps of hypothesis test.
<b>Week 5</b>	Hypothesis Test of Two Means with Known Population Variance.
<b>Week 6</b>	Hypothesis Test of Two Means with Known Population Variance.
<b>Week 7</b>	Hypothesis Test of Two Means with Known Population Variance & confidence interval. applications
<b>Week 8</b>	T- test

<b>Week 9</b>	Test of the Mean with Unknown Population Variance using t statistic
<b>Week 10</b>	Test of the mean with unknown population variance using t statistic & confidence interval
<b>Week 11</b>	Test of the Mean with Unknown Population Variance using t statistic. applications
<b>Week 12</b>	F-test, applications
<b>Week 13</b>	F-test, applications
<b>Week 14</b>	$\chi^2$ - distribution
<b>Week 15</b>	$\chi^2$ -test, applications
<b>Week 16</b>	Final Exam

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	مدخل الى الاحصاء ، د. خاشع الراوي	Yes
<b>Recommended Texts</b>	Introduction to Probability and Statistics for Engineers, Holický, Milan	No
<b>Websites</b>		

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (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 (0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Electrical Engineering	Module Delivery	
Module Type	B	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE110		
ECTS Credits	2		
SWL (hr./sem)	50		
Module Level	UGI		
Administering Department	Civil eng. Dep.	College	College of Engineering
Module Leader	Mr. Yehia Rehab hamdy	e-mail	Yehia.rehab@uomosul.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name	Amina A Khaleel	e-mail	amina.alshumam@uomosul.edu.iq
Scientific Committee Approval Date	1-9-2025	Version Number	1.1

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

أ.م.د. براء جبار محمود  
رئيس قسم الهندسة المدنية



<b>Module Aims, Learning Outcomes and Indicative Contents</b> أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
<b>Module Aims</b> أهداف المادة الدراسية	Learn protection from electric shock when working with electricity, constructing electric map of a house and residential building , making good grounding for a building and house, how to distribute electrical appliances inside the house, constructing electric bell circuits, fluorescent lamp, tester circuit...etc.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1- Learn how to connect circuit on series and parallel.</li> <li>2- Learn how to measure current, voltage and power.</li> <li>3- Distribution of electrical appliances and equipment within residential buildings, laboratories, government departments...etc</li> <li>4- How to properly ground electrical equipment and buildings.</li> <li>5- Protection and prevention from electric lightning.</li> <li>6- An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> <li>7- An ability to acquire and apply new knowledge and using appropriate learning strategies.</li> <li>8- An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><b><u>Part A - Circuit Components and values</u></b> DC circuits, Current and voltage definitions, Passive sign convention and circuit elements, Resistive networks, real and ideal elements, voltage and current sources. [10 hrs.]</p> <p><b><u>Part B- Circuit reduction</u></b> combining sources, Combining resistive elements in series and parallel, delta and star transformation. [10 hrs.]</p> <p><b><u>Part C- Materials and Electrical installation</u></b> Conductors, Insulators, and Semiconductors. Lamps, Circuit breakers, bell (buzzer). [10 hrs.]</p>

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

<b>Student Workload (SWL)</b> الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطلاب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b>	17	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1

الحمل الدراسي غير المنتظم للطالب خلال الفصل		
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	50	

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	24% (24)	4,8,12	LO #1, 5, 8 and 9
	<b>Assignments</b>	2	8% (8)	2 to 12	LO #1, 2, 4, 6 7, 8 and 9
	<b>Projects / Lab.</b>	1	4% (4)		
	<b>Report</b>	1	4% (4)	----	LO #1, 2, 4, 6 7, 8 and 9
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr.	10% (10)	7	LO # 1-5
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Basic Concept & Units: Electricity & atomic structure of substance, current and current density, current flow, electric circuit, E.M. F& potential difference
<b>Week 2</b>	international system of unit, abbreviation for multiples & sub-multiples, quantities derived from SI units, units of force-energy-torque and power, relation between energy and heat, electric units, efficiency & percentage efficiency, electromechanical equivalent of element
<b>Week 3</b>	Ohm's law, resistivity & conductivity
<b>Week 4</b>	temperature affect, internal resistance of a source, open circuit & short circuit
<b>Week 5</b>	equivalent resistance: Series-parallel-circulating current method-floating source method & grouping of E.M.F. sources, double subscript
<b>Week 6</b>	power calculation in D.C circuit
<b>Week 7</b>	Energy calculation in D.C circuit
<b>Week 8</b>	Mid-term Exam
<b>Week 9</b>	General rules for the prevention of electric shock
<b>Week 10</b>	Grounding resistor calculation
<b>Week 11</b>	Grounding installation for houses and buildings
<b>Week 12</b>	Protection and prevention from electric lightning
<b>Week 13</b>	Distribution of electrical appliances and equipment within residential buildings
<b>Week 14</b>	Conducting inspections of electrical devices
<b>Week 15</b>	Voltage drop calculations for transmission lines

Week 16	Final Exam
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<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	Engineering Circuit Analysis 7th Edition by William Hayt , Jack Kemmerly , Steven Durbin	Yes
<b>Recommended Texts</b>	Schaum's Outline of Basic Circuit Analysis, Second Edition (Schaum's Outlines) 2nd Edition, by John O'Malley	No
<b>Websites</b>	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2017.	

<b>Grading Scheme</b> مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (50 - 100)	<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</b> (0 - 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematics III	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE201		
1ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	3
Administering Department	CE	College	ENG
Module Leader	Asaad Al-Omari	e-mail	<a href="mailto:asaad.alomari@uomosul.edu.iq">asaad.alomari@uomosul.edu.iq</a>
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Revan Nahith	e-mail	<a href="mailto:revan.nahith@uomosul.edu.iq">revan.nahith@uomosul.edu.iq</a>
Peer Reviewer Name	Asaad Al-Omari	e-mail	<a href="mailto:asaad.alomari@uomosul.edu.iq">asaad.alomari@uomosul.edu.iq</a>
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	

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## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Provide the fundamental base for elementary mathematics for functions in more than one variable.</li> <li>2. Use mathematical differentiation and integration to solve some engineering problems.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Find the derivative of the functions that have two and three variables.</li> <li>2. Apply integral information to find the area and volume.</li> <li>3. Apply integral information to solve some physical problems.</li> <li>4. Know the hypobaric functions.</li> <li>5. Solve the engineering problem Catenary.</li> <li>6. An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> <li>7. An ability to acquire and apply new knowledge and using appropriate learning strategies.</li> <li>8. An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Chapter 1</u> Partial Derivative. Second Order Partial Derivative, Higher Order Partial Derivative, Chain Rule, Total Derivative, Maximum and Minimum &amp; Saddle Point, t, Lagrange Multipliers [20 hrs]</p> <p><u>Chapter 2</u> Introduction to Multiple Integration Multiple Integrals, Double and Iterated Integrals over Rectangles, Double Integrals over General Regions, Area by Double Integration, Double Integrals in Polar Form, and Moments and Centers of Mass. [20 hrs]</p> <p><u>Chapter 3</u> Introduction to Hyperbolic Functions. Identities of Hyperbolic Functions. Graphs of Hyperbolic Functions. Derivative and Integral of hyperbolic Functions Graphs of Inverse Hyperbolic Functions. Identities of Inverse Hyperbolic Functions. Derivative of Inverse Hyperbolic Functions. The integral of Inverse Hyperbolic Functions. Relationship between Inverse Hyperbolic Functions and Logarithm Formula. [12 hrs]</p> <p><u>Chapter 4</u> Application of Hyperbolic Functions : Catenary [8 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

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

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	30% (30)	5, 10	LO #1, 2, 3
	<b>Assignments</b>	5	10% (10)	2, 12	LO # 1-4
	<b>Projects / Lab.</b>				
	<b>Report</b>				
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	8	LO # 1-3
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Partial Derivative.
<b>Week 2</b>	Second Order Partial Derivative, Higher Order Partial Derivative
<b>Week 3</b>	Chain Rule,
<b>Week 4</b>	Maximum and Minimum & Saddle Point
<b>Week 5</b>	Lagrange Multipliers
<b>Week 6</b>	Introduction to Multiple Integration

<b>Week 7</b>	Multiple Integrals, Double and Iterated Integrals over Rectangles
<b>Week 8</b>	Double Integrals over General Regions, Area by Double Integration
<b>Week 9</b>	Double Integrals in Polar Form
<b>Week 10</b>	Moments and Centers of Mass.
<b>Week 11</b>	Introduction to Hyperbolic Functions. Identities of Hyperbolic Functions. Graphs of Hyperbolic Functions
<b>Week 12</b>	Derivative and Integral of hyperbolic Functions Graphs of Inverse Hyperbolic Functions. Identities of Inverse Hyperbolic Functions
<b>Week 13</b>	Derivative of Inverse Hyperbolic Functions. The integral of Inverse Hyperbolic Functions. Relationship between Inverse Hyperbolic Functions and Logarithm Formula
<b>Week 14</b>	Application of Hyperbolic Functions: Catenary
<b>Week 15</b>	Solve engineering problem about catenary
<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>	Thomas' Calculus by Finney and Thomas.	Yes
<b>Recommended Texts</b>	Thomas' Calculus Early Transcendentals - Thirteenth Edition	No
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (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 (0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Concrete Technology I	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE204		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII		
Administering Department	CE	College	ENG
Module Leader	Dr. Sufyan Younis Ahmad	e-mail	<a href="mailto:sofyan1975@uomosul.edu.iq">sofyan1975@uomosul.edu.iq</a>
Module Leader's Acad. Title	Assistance Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Zeena Adel Mohammed	e-mail	<a href="mailto:zena.adal@uomosul.edu.iq">zena.adal@uomosul.edu.iq</a>
Peer Reviewer Name	Riffa dalli hamad	e-mail	<a href="mailto:Reffashlla@uomosul.edu.iq">Reffashlla@uomosul.edu.iq</a>
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	Concrete Technology II	Semester	4

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## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Introducing all construction materials, specifically cement and aggregate.</li><li>2. Finding the composition of different types of cement and the properties of cement with all tests that used to determine cement properties.</li><li>3. Study the properties of aggregate with all tests that conducted to find these properties.</li><li>4. Study the effect of cement and aggregate properties on the properties of concrete based on workability, strength, and durability.</li><li>5. Study how to calculate the bulking factor in aggregate to calculate the actual volume provided in site.</li><li>6. Study how to correct the weight of fine and coarse aggregate based on their humidity conditions.</li><li>7. Focus on sustainable materials (friendly environmental materials) that can be used as a replacement of construction materials including supplementary cementitious materials and recycling aggregate.</li><li>8. An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li><li>9. An ability to acquire and apply new knowledge and using appropriate learning strategies.</li><li>10. An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Identify the standard specification of quality control for construction materials (cement, aggregate, and water) based on ASTM, BS EN, IQS.</li><li>2. Learn how to conduct all tests to determine the properties of all construction materials specially cement and aggregate and recognize the importance of these properties and their effect on the properties of concrete mixture.</li><li>3. Focus on the properties of plastic concrete including workability, and precautions that should be considered when concreting in hot and cold weather.</li><li>4. Learn how to determine concrete mix ratios (by weight) and convert it to volumes.</li><li>5. Learn how to correct the volume and weight of fine and coarse aggregate based on their moisture.</li><li>6. Identify the importance of using sustainable materials to improve the properties of plastic concrete.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A – Concrete Technology I / Theory</u></p> <p>Introduction – Introduction of all construction materials. [5 hrs]</p> <p>Cement - Focusing in Cement Composition, main compounds of</p>

	<p>cement and their effect on hydration process, types of cements, manufacturing and their uses, Rule of water in hydration, properties of cement according to the specifications. [25 hrs]</p> <p>Aggregate – Identifying the properties of coarse and fine aggregate and their effect on concrete properties, and correct the weight of aggregate based on its humidity. [15 hrs]</p> <p>Determine concrete mix ratios (by weight) and how to convert it to volume ratios. [5 hrs]</p> <p>Properties of fresh concrete including workability and consistency of concrete, rheology of concrete and its plasticity. [10 hrs]</p> <p>Temperature effect on fresh concrete properties and precautions considered in concreting under cold and hot weathers. [10 hrs]</p> <p>Sustainable materials – including supplementary cementitious materials and recycling aggregate. [5 hrs]</p> <p><b>Part B – Concrete Technology I/ Lab</b></p> <p>Writing a good technical report [5 hrs]</p> <p>Tests for ordinary Portland cement including (normal consistency, setting time, compressive strength, tensile strength and the effect on curing conditions on strength development). [25 hrs]</p> <p>Tests of fine and coarse aggregate to determine all its properties including (sieve analysis, specific gravity, unit weight, moisture content, absorption). [20 hrs]</p> <p>Tests of clay and concrete blocks, tests of tiles, and tensile test of steel. [20 hrs]</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم			
<b>Strategies</b>	Type something like: The main strategy that will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.		
<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b>	63	<b>Structured SWL (h/w)</b>	4

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

### Module Evaluation

#### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	14% (10)	5, 10	LO #1, 3, and 4
	<b>Assignments</b>	2	6% (10)	2, 5, 8, 11	All
	<b>Projects / Lab.</b>	1	10% (10)	weekly	All
	<b>Report</b>	1	10% (10)	13	LO # 3, and 4
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	9	LO # 3, and 4
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction of Construction Materials Especially Cement And Concrete Aggregate.
<b>Week 2</b>	Cement Composition.
<b>Week 3</b>	Main Compounds of Cement and Their Effect On Hydration Process.
<b>Week 4</b>	Types of Cements, Manufacturing and Their Uses.
<b>Week 5</b>	Rule of Water in Hydration
<b>Week 6</b>	Concrete Ingredients, Calculating Mix Ratios, and Conversion The Weights to Volumes
<b>Week 7</b>	Aggregate Properties, Sieve Analysis of Fine and Coarse Aggregate
<b>Week 8</b>	Bulking Factor of Aggregates For Volume Correction
<b>Week 9</b>	ACI Code Procedure For Correction of Aggregate Weights Based on Its Humidity.
<b>Week 10</b>	Properties of Fresh Concrete, Workability and Consistency of Fresh Concrete.
<b>Week 11</b>	Standard Tests For Measuring The Workability and Consistency of Concrete.
<b>Week 12</b>	Calculating Yield, Unit Weight, and Cement Factor of fresh (1m <sup>3</sup> ) fresh concrete.
<b>Week 13</b>	Concreting in Hot Weather
<b>Week 14</b>	Concreting in Cold Weather
<b>Week 15</b>	Sustainable Materials (Supplementary Cementitious Materials + Recycling Aggregate)

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Writing a good technical report
Week 2	Lab 2: Tests for ordinary Portland cement (Normal consistency)
Week 3	Lab 3: Tests for ordinary Portland cement (Setting time)
Week 4	Lab 4: Tests of cement mortar (Compressive strength for different ages).
Week 5	Lab 5: Tests for cement mortar (Tensile strength for different ages).
Week 6	Lab 6: Sieve analysis of coarse aggregates (Grading , M.A.S , and A.S.S).
Week 7	Lab 7: Sieve analysis of fine aggregates (Grading , FM , and Fine materials passing No. 200).
Week 8	Lab 8: Midterm Exam.
Week 9	Lab 9: Tests for aggregates (Specific gravity of fine and coarse aggregates).
Week 10	Lab 10: Tests for aggregates (Unit weight, Absorption).
Week 11	Lab 11: Test of concrete blocks (Compressive strength ,Unit weight, Absorption).
Week 12	Lab 12: Tensile test and modulus of elasticity for steel.
Week 13	Lab 13: Tests for clayey Bricks (Compressive strength ,Unit weight, Absorption).
Week 14	Lab 14: Tests for tiles (Flexural tensile strength, Absorption).
Week 15	Lab 15: Activity Index of sustainable Cementitious materials.

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Composition and properties of concrete (Troxell)	Yes (Text Book)
Recommended Texts	Properties of Concrete (M. Neville)	Yes
Websites	N/A	

## Grading Scheme

### مخطط الدرجات

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

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Fluid Mechanics	Module Delivery	
Module Type	B	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE203		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII		
Administering Department	CE	College	ENG
Module Leader	Dr. Khansaa Abdulelah AHMED	e-mail	khansaa.abd@uomosul.edu.iq
Module Leader's Acad. Title	lecture	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Khansaa Abdulelah AHMED	e-mail	khansaa.abd@uomosul.edu.iq
Peer Reviewer Name	Riffa dalli hamad	e-mail	Reffashlla@uomosul.edu.iq
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	

أ.م.د. براء جبار مجنون  
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## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Objectives</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Understanding fluid behavior: Fluid mechanics helps engineers understand the fundamental principles governing the behavior of fluids, both liquids and gases. This includes studying fluid properties, such as density, viscosity, and pressure, as well as understanding how fluids flow, interact, and react under different conditions.</li><li>2. Analysis and design of fluid systems: Fluid mechanics provides the necessary tools and techniques for analyzing and designing various engineering systems involving fluids. This includes designing pipelines, channels, pumps, turbines, compressors, and other devices that handle fluids. Engineers need to understand fluid mechanics to ensure efficient and safe operation of these systems.</li><li>3. Fluid flow measurement and control: Fluid mechanics helps engineers learn about different techniques and instruments used for measuring fluid flow rates, pressures, velocities, and other parameters. This knowledge is crucial for maintaining control and optimizing performance in industrial processes, such as chemical plants, power generation, and oil refineries.</li><li>4. Aerodynamics and hydrodynamics: Fluid mechanics plays a significant role in the study of aerodynamics (air flow) and hydrodynamics (water flow). These fields are essential for designing efficient aircraft, automobiles, ships, and submarines. Engineers use fluid mechanics principles to analyze and improve the performance, stability, and maneuverability of these vehicles.</li><li>5. Energy efficiency: Head loss is directly related to energy losses in fluid systems. By studying head loss, engineers can identify areas of high energy dissipation and implement measures to reduce it. This leads to improved energy efficiency and reduced operating costs. Engineers can select pipe materials with lower friction factors, design smoother pipe fittings, or employ strategies such as pump optimization to minimize head loss and energy consumption.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Understanding of hydrostatics: Civil engineers need to understand the principles of hydrostatics, which involve the study of fluids at rest. This includes topics such as pressure distribution in fluids, forces on submerged surfaces.</li><li>2. Analysis of fluid flow in pipes and channels: Civil engineers frequently encounter fluid flow in pipes and open channels. Studying fluid mechanics helps in understanding the behavior of fluids in these systems, including topics such as energy losses, flow rates, pressure distribution, and hydraulic design.</li><li>3. Understanding fluid forces and flow patterns helps engineers ensure the stability, functionality, and safety of these structures in different hydraulic condition.</li><li>4. Understanding energy conservation in fluid flow: The Bernoulli equation represents a fundamental principle of energy conservation in fluid flow. By studying the Bernoulli equation, civil engineers gain an understanding of how energy is transferred and conserved in fluid systems.</li><li>5. Understanding fluid dynamics around structures: The Bernoulli equation helps</li></ol>

	<p>civil engineers understand fluid dynamics around structures, such as weirs, spillways, and bridges.</p> <ol style="list-style-type: none"> <li>6. Design and analysis of fluid systems: Understanding head loss is crucial for designing and analyzing fluid systems, such as pipelines, ducts, and channels. By studying head loss, engineers can determine the pressure drop along a flow path and ensure that the system operates efficiently. This knowledge helps in selecting appropriate pipe sizes, optimizing the layout of the system, and ensuring that the required flow rates and pressures are maintained.</li> <li>7. Understanding of fluid forces: The momentum equation is a fundamental principle that relates the forces acting on a fluid to changes in its momentum. By studying the momentum equation, civil engineers gain an understanding of fluid forces, including pressure forces and viscous forces. This knowledge is crucial for designing structures that interact with fluid flows, such as dams, bridges, and offshore platforms, and for analyzing the stability and safety of hydraulic systems.</li> <li>8. Design and analysis of hydraulic structures: The continuity equation is applicable to the design and analysis of various hydraulic structures encountered in civil engineering. Civil engineers can use the continuity equation to analyze the flow behavior and hydraulic performance of structures such as weirs, spillways, culverts, and hydraulic jumps. This knowledge helps engineers ensure the proper functioning and safety of these structures under different flow conditions.</li> <li>9. An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> <li>10. An ability to acquire and apply new knowledge and using appropriate learning strategies.</li> <li>11. An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"> <li>1. Introduction of Fluid Mechanics: Definition and properties of fluids, Fluid Statics: Pressure and forces.</li> <li>2. Fluid static: Pascal Law, Viscosity, Surface tension, Capillarity. Fluid Dynamics: flow characteristics and classifications [10 hrs] Fluid Kinematics: Flow visualization and description, streamlines, Velocity and discharge. [10 hrs]</li> <li>3. Fluid flow in pipes and Ducts: Laminar and turbulent flow, Reynolds number and flow regimes, Pressure drop Conservation laws and control volume analysis, continuity equation, Euler equation of motion, Bernoulli equation (energy equation) in ideal and real fluids and head loss calculation. Flow measurements: Principles and types of flow measuring devices, Venturi meter, Orifice meter, and Pitot tube. [10 hrs]</li> <li>4. Momentum equation and computation of forces acting on a fluid to changes in its momentum.</li> <li>5. Pumps and Turbines. [5 hrs]</li> <li>6. Head loss calculation. [5 hrs]</li> <li>7. Three reservoir Problems. [5 hrs]</li> <li>8. Design and analysis of a multi-pipe system involve considering several factors,</li> </ol>

	<p>such as pipe sizing, pipe material selection, hydraulic calculations, pressure drop, and flow distribution. [8 hrs]</p> <p>9. Flow in open channels: Types of Flow, Channel Geometry, Flow Velocity and Discharge, Manning Equation. [10 hrs]</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<ol style="list-style-type: none"> <li><b>Lectures:</b> Lectures serve as the primary mode of delivering content in fluid mechanics courses. Instructors use presentations, demonstrations, and visual aids to explain theoretical concepts, equations, and fundamental principles. They may also incorporate real-world examples and applications to help students connect theory to practice.</li> <li><b>Problem-solving:</b> Fluid mechanics is a highly problem-oriented subject. Instructors often emphasize problem-solving exercises and provide students with practice questions that cover a range of difficulty levels. Solving these problems helps students develop analytical and critical thinking skills, apply theoretical concepts to practical situations, and reinforce their understanding of the subject.</li> <li><b>Laboratory experiments:</b> Hands-on laboratory experiments provide students with an opportunity to observe fluid phenomena and validate theoretical concepts. By conducting experiments involving flow measurements, fluid properties, and hydraulic systems, students gain practical experience and learn how to use instruments and equipment commonly used in fluid mechanics.</li> <li><b>Online resources and interactive tools:</b> Online resources, such as interactive simulations, virtual labs, and multimedia materials, can supplement traditional teaching methods. These resources provide students with additional opportunities for self-study, practice, and exploration of fluid mechanics concepts at their own pace.</li> </ol>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

<b>Module Evaluation</b> تقييم المادة الدراسية				
	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome

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

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	<b>Material Covered</b>
<b>Week 1</b>	Fluid Definition, Units and dimensions, Fluid properties.
<b>Week 2</b>	Viscosity and Newtons Law
<b>Week 3</b>	Ideal and Real Fluids, Capillary, Surface Tension
<b>Week 4</b>	Static Fluid, Pascal Law, Basic equation for static fluids,
<b>Week 5</b>	Pressure in fluids, types of pressure, pressure measurement devices
<b>Week 6</b>	Kinematics of Fluid motion, Types of flow, Continuity Equation.
<b>Week 7</b>	Mid-term Exam
<b>Week 8</b>	Bernoulli Equation.
<b>Week 9</b>	Application of Bernoulli Equation
<b>Week 10</b>	Momentum Equation and application
<b>Week 11</b>	Pumps and Turbines
<b>Week 12</b>	Flow in Real Fluids, Head Loss
<b>Week 13</b>	Multi Pipe system, Pipes in Parallel, Pipes in Series.
<b>Week 14</b>	Three Reservoir Problems
<b>Week 15</b>	Flow in open channels
<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>	Lab 1: Reynold Number.
<b>Week 2</b>	Lab 2: Impact of Jet.
<b>Week 3</b>	Lab 3: Center of Pressure.
<b>Week 4</b>	Lab 4: Bernoulli equation.
<b>Week 5</b>	Lab 5: Venturi meter.
<b>Week 6</b>	Lab 6: Friction factor for pipes.

<b>Week 7</b>	Lab 7: Flow through orifice.
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<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Street, R.L., Watters, G.Z. and Vennard, J.K., 1996. Elementary fluid mechanics. ( <i>John Wiley</i> ).	Yes
<b>Recommended Texts</b>	Cimbala, J.M. and Cengel, Y.A., 2006. <i>Fluid mechanics: fundamentals and applications</i> . McGraw-Hill Higher Education.	No only online
<b>Websites</b>	<a href="https://www.udemy.com/course/the-complete-course-of-fluid-mechanics-for-engineers-2021/">https://www.udemy.com/course/the-complete-course-of-fluid-mechanics-for-engineers-2021/</a> <a href="https://www.edx.org/learn/fluid-mechanics">https://www.edx.org/learn/fluid-mechanics</a>	

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

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mechanics of Materials I		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CE202		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	
Administering Department	CE	College	ENG
Module Leader	Dr. Ali Natheer Abdul Baki	e-mail	<a href="mailto:aliabdulbaki@uomosul.edu.iq">aliabdulbaki@uomosul.edu.iq</a>
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Khalid Ahmed Abdullah	e-mail	<a href="mailto:khalid.alnuaemie75@uomosul.edu.iq">khalid.alnuaemie75@uomosul.edu.iq</a>
Peer Reviewer Name	Dr. Ali Natheer Abdul Baki	e-mail	<a href="mailto:aliabdulbaki@uomosul.edu.iq">aliabdulbaki@uomosul.edu.iq</a>
Scientific Committee Approval Date	1-9-2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CE102, CE107	Semester	one, two
Co-requisites module	None	Semester	

أ.د. نداء تجارة محمود  
رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Teaching students the developed stresses, strains, and the effects of Poisson's ratio in various types of structural elements.</li> <li>2. Teaching students the developed stresses due to changes in temperature or torsion.</li> <li>3. Teaching students in detail drawings of the shear and moment diagrams and the calculation of deflection and rotation in beams and drawing of the elastic curve.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Ability to calculate the developed stresses in various structural elements.</li> <li>2. Ability to calculate the developed strains in various structural elements.</li> <li>3. Ability to calculate the developed thermal stresses in various structural elements.</li> <li>4. Ability to calculate the developed stresses in various structural elements due to torsion.</li> <li>5. Ability to draw the shear and moment diagram and find maximum shear and moments in beams.</li> <li>6. Ability to draw the elastic curve of loaded beams.</li> <li>7. Ability to calculate the developed deflections and the angle of rotation in beams.</li> <li>8. An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> <li>9. An ability to acquire and apply new knowledge and using appropriate learning strategies.</li> <li>10. An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Simple stress</u> Simple stress is developed in structural members when these members are subjected to an external load. There are three types of stresses: normal stress, shearing stress, and bearing stress. [10 hrs]</p> <p><u>Simple strain</u> The normal strain is developed in a structural member, like a bar, due to the presence of axial loading or changes in temperatures. The stress-strain curve for structural materials, such as low-carbon steel and aluminum, and Hooke's law are explained in detail. In addition, Poisson's ratio, which is the ratio between the lateral and axial strain. Finally, compatibility equations are required to solve statically indeterminate problems, in these problems, the internal forces cannot be determined from statics alone. [20 hrs]</p> <p><u>Torsion</u> The torsional stress, which is developed due to the applied torsional moment, is calculated for circular sections (solids and hollow). [5 hrs]</p> <p><u>Shear and moment in beams</u> Beam is a bar, which is subjected to transverse loads, the internal forces in any section of the beam will generally consist of a shear force <math>V</math> and a bending couple <math>M</math>. The shear force <math>V</math> creates shearing stresses in that section, while the bending couple <math>M</math> creates normal stresses in the cross-section. Determining the maximum absolute values of the</p>

	<p>shear and the bending moment in a beam are greatly facilitated if V and M are plotted against the distance x measured from one end of the beam. Both of the equations method and the area method are utilized to draw the shear and moment diagram. [20 hrs]</p> <p><u>Deflection in beams</u></p> <p>From a structural perspective, deflection in a beam means the movement of a beam or node respecting its original location. The deflection is happened due to applied loads. The double integration method and area method are utilized to calculate deflection and rotation at any point on the beam. [20 hrs]</p>
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<b>Learning and Teaching Strategies</b> 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 and interactive tutorials.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	7	20% (20)	3,6,8,10,12,13,15	LO #1, 2, 3, 4, 5, 6 and 7
	<b>Assignments</b>	7	15% (15)	2,5,7,9,11,12,14	LO #1, 2, 3, 4, 5, 6 and 7
	<b>Report</b>	1	5% (5)	8	LO # 1, 2, 3, 4 and 5
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	3 hr	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 – Simple stress
<b>Week 2</b>	Simple stress (normal stress, shearing stress and bearing stress)
<b>Week 3</b>	Simple strain (Stress – Strain relationship and Hook's Law)
<b>Week 4</b>	Simple strain (Poisson's ratio and statically indeterminate members)
<b>Week 5</b>	Simple strain caused by thermal stresses
<b>Week 6</b>	Simple strain caused by thermal stresses + Torsion
<b>Week 7</b>	Mid-term Exam + Torsion
<b>Week 8</b>	Shear and moment in beams / shear and moment diagram (Equations method)
<b>Week 9</b>	Shear and moment diagram (Equations method)
<b>Week 10</b>	Shear and moment diagram (Area method)
<b>Week 11</b>	Shear and moment diagram (Area method)
<b>Week 12</b>	Deflection in beams (Double integration method)
<b>Week 13</b>	Deflection in beams (Moment-area method)
<b>Week 14</b>	Deflection in beams (Moment-area method)
<b>Week 15</b>	Deflection in beams (Moment-area method)
<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>	Strength of materials; Andrew Pytel; Ferdinand Leon Singer	Yes
<b>Recommended Texts</b>	Mechanics of Materials; Ferdinand P. Beer, E. Russell Johnston Jr., John T. DeWolf, David F. Mazurek	Yes
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (50 - 100)	<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</b> (0 – 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Surveying I		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CE205		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGII	Semester of Delivery	
Administering Department	CE	College	ENG
Module Leader	Yezin A. Alnajjar	e-mail	<a href="mailto:Yazinalnajjar@uomosul.edu.iq">Yazinalnajjar@uomosul.edu.iq</a>
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Zeena A. Al-Kazzaz	e-mail	<a href="mailto:Zeena.kazzaz@uomosul.edu.iq">Zeena.kazzaz@uomosul.edu.iq</a>
Peer Reviewer Name	Yezin A. Alnajjar	e-mail	<a href="mailto:Yazinalnajjar@uomosul.edu.iq">Yazinalnajjar@uomosul.edu.iq</a>
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	

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## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Objectives</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. To develop problem solving skills and understanding of surveying theory through the application of techniques.</li> <li>2. To understand linear and level measurements.</li> <li>3. This course deals with the basic concept of surveying.</li> <li>4. This is the basic subject for surveying.</li> <li>5. To understand instruments.</li> <li>6. To understand contouring.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Define surveying and types.</li> <li>2. Angle units and conversions. Error types.</li> <li>3. Scale types.</li> <li>4. Basic surveying tools.</li> <li>5. Distance measurements by tape.</li> <li>6. Levels types and calculations.</li> <li>7. Earth curvature and refraction.</li> <li>8. Reciprocal leveling.</li> <li>9. Two peg test.</li> <li>10. Longitudinal and cross sections.</li> <li>11. Contour lines.</li> <li>12. An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics.</li> <li>13. An ability to acquire and apply new knowledge and using appropriate learning strategies.</li> <li>14. An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><b><u>Part A: theory</u></b></p> <p>Definition and types, history. Types of error- mistakes, systematic and random. [6 hrs] Different formats of angles. How to convert, Scales, stations, basic map contents.[6 hrs] Revision problem classes [5 hrs] Leveling definitions and basics. Method of leveling. Types of levels, effects of Earth curvature and refraction. [14 hrs] Longitudinal and cross sections. Contours. [10 hrs]</p> <p><b><u>Part B: Lab</u></b></p> <p>Basic Surveying Instruments and Tools, Definition and Care (3hrs) Measuring distances with tape and other methods (3hrs) Surveying a building using the direct method (3hrs) Establishing and dropping vertical columns (3hrs) Measuring distances in the presence of obstacles (3hrs) Identifying the leveling instrument and its components (3hrs) Setting up the leveling instrument and taking readings (3hrs) Using the leveling instrument for transferring point elevations (fly leveling) (3hrs)</p>

	Using the leveling instrument for precision leveling (3hrs) Finding intermediate point elevations (3hrs) Finding negative point elevations (3hrs) Conducting the two-peg test (3hrs) Conducting the reverse leveling (3hrs) Longitudinal profiles (3hrs) Cross-sectional profiles (3hrs)
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### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple activities that are interesting to the students.
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### Student Workload (SWL)

#### الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

### Module Evaluation

#### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	14% (7)	5 and 10	LO #1, #2 and #10, #11
	<b>H.w. Assignments</b>	1	3% (3)	2 and 12	LO #3, #4 and #6, #7
	<b>Class Assignments</b>	1	3% (3)		
	<b>Projects / Lab. Report</b>	4	20% (5)	Continuous	All

<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	<b>Material Covered</b>
<b>Week 1</b>	Introduction to surveying, basic definitions
<b>Week 2</b>	Angles and conversions
<b>Week 3</b>	Types of errors
<b>Week 4</b>	Basic surveying tools
<b>Week 5</b>	Measuring lines
<b>Week 6</b>	Types of obstacles, Quiz
<b>Week 7</b>	Systematic errors in tape measurements
<b>Week 8</b>	Midterm Examination
<b>Week 9</b>	Basic leveling definitions, Optics of levels
<b>Week 10</b>	Types of levels
<b>Week 11</b>	HI method of leveling
<b>Week 12</b>	Check leveling, Two peg test, Effect of curvature and refraction
<b>Week 13</b>	Reciprocal leveling
<b>Week 14</b>	Longitudinal and cross sections, Contouring
<b>Week 15</b>	contouring
<b>Week 16</b>	Preparing for Final Exam

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Basic Surveying Instruments and Tools, Definition and Care.
<b>Week 2</b>	Lab 2: Measuring distances with tape and other methods.
<b>Week 3</b>	Lab 3: Surveying a building using the direct method.
<b>Week 4</b>	Lab 4: Establishing and dropping vertical columns.
<b>Week 5</b>	Lab 5: Measuring distances in the presence of obstacles.
<b>Week 6</b>	Lab 6: Identifying the leveling instrument and its components.
<b>Week 7</b>	Lab 7: Setting up the leveling instrument and taking readings.
<b>Week 8</b>	Lab 8: Using the leveling instrument for transferring point elevations (fly leveling).
<b>Week 9</b>	Lab 9: Using the leveling instrument for precision leveling.

<b>Week 10</b>	Lab 10: Finding intermediate point elevations.
<b>Week 11</b>	Lab 11: Finding negative point elevations.
<b>Week 12</b>	Lab 12: Conducting the two-peg test.
<b>Week 13</b>	Lab 13: Conducting the reverse leveling.
<b>Week 14</b>	Lab 14: Longitudinal profiles.
<b>Week 15</b>	Lab 15: Cross-sectional profiles.

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Kavanagh, Barry and Diane K. Slattery. Surveying with Construction Applications. 8th ed., Pearson Education, Inc., 2014.	Yes
<b>Recommended Texts</b>	Kavanagh, Barry and Diane K. Slattery. Surveying with Construction Applications. 8th ed., Pearson Education, Inc., 2014.	No
<b>Websites</b>	<a href="https://www.coursera.org/browse/physical-science-and-engineering/civil-engineering">https://www.coursera.org/browse/physical-science-and-engineering/civil-engineering</a>	

### Grading Scheme

#### مخطط الدرجات

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

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	اللغة العربية	Module Delivery	
Module Type	S	<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar	
Module Code	UOM2012		
ECTS Credits	2		
SWL (hr/sem) الحمل الكلي	50		
Module Level	UGII	Semester of Delivery	3
Administering Department	Civil Eng Dept	College	College of Engineering
Module Leader	Dr. Abeer Turki Fathi	e-mail	abeer_altaee@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Asaad Al-Omari	e-mail	asaad.alomari@uomosul.edu.iq
Scientific Committee Approval Date	1-9-2025	Version Number	1.0

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

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<b>Module Aims, Learning Outcomes and Indicative Contents</b>	
<b>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</b>	
<b>Module Objectives</b> أهداف المادة الدراسية	الهدف من هذا الفصل الدراسي هو تمكين الطالب من القراءة الصحيحة، وأن يكتسب القدرة على استعمال اللغة استعمالاً صحيحاً في الاتصال مع الآخرين؛ كالسرعة وجودة الإلقاء وحسن التعبير، وتعيده حسن الاستماع وتنمية الذوق الأدبي لدى الطالب وتعيده على التعبيرات السليمة الواضحة.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p><b>CLO1:</b> تعريف الطالب بضرورة ممارسة قواعد الكتابة والكلام باللغة العربية الفصيحة.</p> <p><b>CLO2:</b> تعريف الطالب بمستويات نظام اللغة العربية</p> <p><b>CLO3:</b> تعميق اتصال الطالب بالتراث العربي والإسلامي.</p> <p><b>CLO4:</b> تعزيز البحث العلمي في مجال اللغة العربية وعلومها لإعداد الدراسات والبحوث.</p> <p><b>CLO5:</b> إظهار جمال اللغة العربية واتساع معانيها واساليبها الإنشائية.</p> <p><b>CLO6:</b> تمكين الطالب من تجاوز الأخطاء اللغوية وتصحيحها.</p> <p><b>CLO7:</b> تنمية الذوق الأدبي لدى الطالب لإدراك النواحي الجمالية في أسلوب الكلام وصوره ومعانيه.</p> <p><b>CLO8:</b> التعريف بأبرز شعراء العصر العباسي.</p>
<b>Indicative Contents</b> المحتويات الإرشادية	<p><b>الجزء الأول: (6 ساعات)</b> قواعد اللغة العربية (النحو) المبتدأ والخبر نواسخ المبتدأ والخبر</p> <p><b>الجزء الثاني: (6 ساعات)</b> كان واخواتها إن واخواتها ظن واخواتها</p> <p><b>الجزء الثالث: (6 ساعات)</b> الامتحان الفصلي الأسماء المنصوبة المفعول المطلق</p> <p><b>الجزء الرابع: (4 ساعات)</b> الأخطاء اللغوية الأملأ</p> <p><b>الجزء الخامس: (8 ساعات)</b> الادب في العصر العباسي الشاعر المتنبي الشاعر أبو تمام الشاعر أبو فراس الحمداني</p>
<b>Learning and Teaching Strategies</b>	
<b>استراتيجيات التعلم والتعليم</b>	
<b>Strategies</b> الاستراتيجيات	إنّ الغاية الأساسية من دروس اللغة العربية هو القضاء على الصعوبة والجمود الذي قد يصاحب مواضيع بعض هذه الدروس، بالإضافة إلى إيصال الأفكار والمعلومات المطلوبة إلى الطلاب بطرق مفهومة وتناسب الفروقات الفردية بينهم، ومن أبرز ما تم التركيز عليه في المحاضرات هو قواعد اللغة العربية والأدب وتتمثل الدراسة بالمحاضرات والامتحانات والواجبات داخل الصف والمناقشة والواجبات المنزلية.
<b>Student Workload (SWL)</b>	
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعاً	

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	2.2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	1.1
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>50</b>		

### Module Evaluation

#### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative Assessment</b> التقويم التكويني	<b>Quizzes</b> الكويز	3	5% (15)	4,8 and 10	All
	<b>H.W Assignments</b> الواجبات البيتية	2	5% (10)	6, 7	CLO4, CLO5, and CLO6
	<b>Seminars</b> السمنار	1	5% (5)	12	All
	<b>On-site Assignment</b> واجبات داخل الصف	2	5% (10)	6, 10	CLO4, CLO5, and CLO6
<b>Summative Assessment</b> التقويم التلخيصي	<b>Midterm Exam</b> امتحان نصف الفصل	2 hrs	10% (10)	7	All
	<b>Final Exam</b> الامتحان النهائي	3 hrs	50% (50)	16	All
<b>Total Assessment / التقويم النهائي</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	Material Covered / المواضيع المغطاة
<b>Week 1</b>	قواعد اللغة العربية (النحو)
<b>Week 2</b>	المبتدأ والخبر
<b>Week 3</b>	نواسخ المبتدأ والخبر
<b>Week 4</b>	كان واخواتها
<b>Week 5</b>	إن واخواتها
<b>Week 6</b>	ظن واخواتها
<b>Week 7</b>	ظن واخواتها
<b>Week 8</b>	الأسماء المنصوبة
<b>Week 9</b>	المفعول المطلق
<b>Week 10</b>	الأخطاء اللغوية
<b>Week 11</b>	الأملاء

Week 12	الادب في العصر العباسي
Week 13	الشاعر المتنبي
Week 14	الشاعر أبو تمام
Week 15	الشاعر أبو فراس الحمداني
Week 16	الامتحان النهائي

### Delivery Plan (Weekly Lab. Syllabus)

Material Covered / المواضيع المغطاة	
Week 1	لا يوجد
Week 2	لا يوجد
Week 3	لا يوجد
Week 4	لا يوجد
Week 5	لا يوجد
Week 6	لا يوجد
Week 7	لا يوجد

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text الاسم	Available in the Library? هل متوفر في المكتبة؟
<b>Required Texts</b> المنهج المطلوب	النحو الوافي / عباس حسن	نعم
<b>Recommended Texts</b> المنهج الموصى به	في الأدب العباسي / محمد مهدي البصير	نعم
<b>Websites</b> المواقع الالكترونية	<a href="https://uomosul.edu.iq/en/engineering/environmental-engineering-dept/">https://uomosul.edu.iq/en/engineering/environmental-engineering-dept/</a>	

### Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (50 - 100)	<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</b> (0 - 49)	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematics IV	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE206		
1ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII		
Administering Department	CE	College	ENG
Module Leader	Asaad Al-Omari	e-mail	<a href="mailto:asaad.alomari@uomosul.edu.iq">asaad.alomari@uomosul.edu.iq</a>
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Revan Nahith	e-mail	<a href="mailto:revan.nahith@uomosul.edu.iq">revan.nahith@uomosul.edu.iq</a>
Peer Reviewer Name	Asaad Al-Omari	e-mail	<a href="mailto:asaad.alomari@uomosul.edu.iq">asaad.alomari@uomosul.edu.iq</a>
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	

أ.م.د. براء جبار محمود  
رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. Provide the fundamental base for elementary mathematics for Vectors and differential equations</li> <li>2. Use mathematical information in vectors to solve some engineering problems.</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Know the student the three-dimensional coordinate system.</li> <li>2. Find the dot and cross product and angle between vectors</li> <li>3. Know the equation and parametric equation.</li> <li>4. Solve the differential equations in first-order first-degree.</li> <li>5. Solve linear differential equations in high order.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><u>Part A</u></p> <p>Three-Dimensional Coordinate Systems, The Distance Between two points, Vectors, Component Form, Vector Algebra Operations, Properties of Vector Operations, Midpoint of a Line Segment, The Dot Product, Angle Between Vectors [8 hrs]</p> <p>The Angle Between Two Nonzero Vectors <math>u</math> and <math>v</math>, Orthogonal Vectors, Dot Product Properties and Vector Projections. The Cross Product, The Cross Product of Two Vectors in Space, Parallel Vectors. [8 hrs]</p> <p>Properties of the Cross Product, Area of a Parallelogram, Calculating the Cross Product as a Determinant Lines and Planes in Space. Lines and Line Segments in Space. Parametric Equations for a Line, [8 hrs]</p> <p>The Distance from a Point to a Line in Space. An Equation for a Plane in Space, Equation for a Plane, Lines of Intersection, The Distance from a Point to a Plane, Angles Between Planes [4 hrs]</p> <p><u>Part B</u></p> <p>Differential Equations: Definition, Classification, order and degree of Des Homogeneity and linearity of the DEs, Generation of the DEs. Solution of DEs (First order First degree DEs by Separable method). Homogenous and non-homogenous DEs method). [8 hrs]</p> <p>Solution of DEs (First order First degree DEs by Linear and nonlinear method). Exact and non-exact method [8 hrs]</p> <p>Second order DEs for X-is missing, y-missing Solution of DEs (higher order DEs – Complementary solution + Particular solution). [16 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.</p>
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	30% (30)	5, 10	LO #1, 2, 3
	<b>Assignments</b>	5	10% (10)	2, 12	LO # 1-4
	<b>Projects / Lab.</b>				
	<b>Report</b>				
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	8	LO # 1-3
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Three-Dimensional Coordinate Systems, The Distance Between two points Vectors, Component Form, Vector Algebra Operations, Properties of Vector Operations, Midpoint of a Line Segment
<b>Week 2</b>	The Dot Product, Angle Between Vectors. The Angle Between Two Nonzero Vectors $u$ and $v$ , Orthogonal Vectors, Dot Product Properties and Vector Projections.
<b>Week 3</b>	The Cross Product, The Cross Product of Two Vectors in Space, Parallel Vectors Properties of the Cross Product, Area of a Parallelogram, Calculating the Cross Product as a Determinant
<b>Week 4</b>	Lines and Planes in Space. Line
<b>Week 5</b>	Vector Equation for a Line.
<b>Week 6</b>	Parametric Equations for a Line, The Distance from a Point to a Line in Space
<b>Week 7</b>	An Equation for a Plane in Space, Equation for a Plane, Lines of Intersection, The Distance from a Point to a Plane, Angles Between Planes
<b>Week 8</b>	Differential Equations: Definition, Classification, order and degree of
<b>Week 9</b>	DEs Homogeneity and linearity of the DEs, Generation of the DEs

<b>Week 10</b>	First order First degree DEs by Separable method
<b>Week 11</b>	First order First degree DEs by linear and nonlinear DEs method
<b>Week 12</b>	First order First degree DEs by Exact and non-Exact DEs method
<b>Week 13</b>	Second order DEs for X-is missing, y-missing
<b>Week 14</b>	higher order DEs – Complementary solution + Particular solution).
<b>Week 15</b>	higher order DEs – Complementary solution + Particular solution).
<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>	Thomas' Calculus by Finney and Thomas.	Yes
<b>Recommended Texts</b>	Thomas' Calculus Early Transcendentals - Thirteenth Edition	No
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (50 - 100)	<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</b> (0 – 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mechanics of Materials II		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CE207		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGII	Semester of Delivery	
Administering Department	CE	College	ENG
Module Leader	Dr. Ali Natheer Abdul Baki	e-mail	<a href="mailto:aliabdulbaki@uomosul.edu.iq">aliabdulbaki@uomosul.edu.iq</a>
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Khalid Ahmed Abdullah	e-mail	<a href="mailto:khalid.alnuaemie75@uomosul.edu.iq">khalid.alnuaemie75@uomosul.edu.iq</a>
Peer Reviewer Name	Dr. Ali Natheer Abdul Baki	e-mail	<a href="mailto:aliabdulbaki@uomosul.edu.iq">aliabdulbaki@uomosul.edu.iq</a>
Scientific Committee Approval Date	1-9-2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CE102, CE107	Semester	one, two
Co-requisites module	None	Semester	

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## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	1. Teaching students the developed Tensile and compressive bending stresses in beams (symmetrical cross-section). 2. Teaching students the developed Shear stress in beams. 3. Teaching students the developed Combined stresses in beams 4. Teaching students the developed stresses in beams by Mohr's Circle method.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	1. Ability to calculate developed bending stress in beams. 2. Ability to calculate developed shear stress in beams. 3. Ability to calculate developed combined stresses in beam 4. Ability learn to determine the stresses created by such combined loadings in structures.
<b>Indicative Contents</b> المحتويات الإرشادية	Indicative content includes the following. <u>Bending Stress in beam</u> bending stress is developed in beam when these beams are subjected to an external load. [20 hrs] <u>shear Stress in beam</u> shear stress is developed in beam when these beams are subjected to an external load. [20 hrs] <u>Combined stresses in beams</u> There are four possible combinations of these loadings: (1) axial and flexural; (2) axial and torsional; (3) torsional and flexural: and (4) axial, torsional, and flexural,(to combine normal stresses in beams). [20 hrs]. <u>Mohr's Circle</u> the stress applied in the cross-section of the beam is represented and developed by the Moh'r circle. [15 hrs].

## 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.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5

<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150
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<b>Module Evaluation</b> تقييم المادة الدراسية					
		<b>Time/ Number</b>	<b>Weight (Marks)</b>	<b>Week Due</b>	<b>Relevant Learning Outcome</b>
<b>Formative assessment</b>	<b>Quizzes</b>	7	20% (20)	3,6,8,10,12,13,15	LO #1, 2, 3, 4, 5, 6 and 7
	<b>Assignments</b>	7	15% (15)	2,5,7,9,11,12,14	LO #1, 2, 3, 4, 5, 6 and 7
	<b>Report</b>	1	5% (5)	8	LO # 1, 2, 3, 4 and 5
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	3 hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Introduction – shear and bending moment in beam
<b>Week 2</b>	Tensile and compressive bending stresses in beams (symmetrical cross-section)
<b>Week 3</b>	Tensile and compressive bending stresses in beams (unsymmetrical cross-section)
<b>Week 4</b>	Shear stress in solid section beams
<b>Week 5</b>	Shear stress in deferent section beams
<b>Week 6</b>	Shear stress in deferent section beams
<b>Week 7</b>	Mid-term Exam+ Introduction - Combined stresses
<b>Week 8</b>	Combined stresses deferent structure member
<b>Week 9</b>	Combined stresses in beams (axial and flexural)
<b>Week 10</b>	Combined stresses in beams (axial and torsional)
<b>Week 11</b>	Combined stresses in beams (torsional and flexural).
<b>Week 12</b>	Combined stresses in beams (axial, torsional, and flexural)
<b>Week 13</b>	represented stresses in cross section beam by equations
<b>Week 14</b>	represented stresses in cross section beam by Mohr's Circle
<b>Week 15</b>	represented stresses in cross section beam by Mohr's Circle
<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>	Strength of materials; Andrew Pytel; Ferdinand Leon Singer	Yes
<b>Recommended Texts</b>	Mechanics of Materials; Ferdinand P. Beer, E. Russell Johnston Jr., John T. DeWolf, David F. Mazurek	Yes
<b>Websites</b>		

## Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (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 (0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Building construction and damages assessment	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE208		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGII	Semester of Delivery	4
Administering Department	CE	College	ENG
Module Leader	Zeena Adel Mohammed Atheer Khudhur Jumaah	e-mail	<a href="mailto:Zena.adal@uomosul.edu.iq">Zena.adal@uomosul.edu.iq</a> <a href="mailto:atheer.khudhur@uomosul.edu.iq">atheer.khudhur@uomosul.edu.iq</a>
Module Leader's Acad. Title	lecture	Module Leader's Qualification	M.sc.
Module Tutor	Name (if available)	e-mail	
Peer Reviewer Name	Asaad Al-Omari	e-mail	asaad.alomari@uomosul.edu.iq
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	

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رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. تطوير مهارات الطلبة للتعرف على أنواع المباني من الناحية الانشائية</li> <li>2. يتناول المقرر المراحل الأساسية لطريقة انشاء المباني</li> <li>3. يتناول المقرر المشاكل التي تتعرض لها الأبنية من الناحية التنفيذية</li> <li>4. تطوير مهارات الطلبة في التعرف على محددات المواصفات الانشائية</li> <li>5. توضيح اسباب التلف والاضرار في الأبنية</li> <li>6. تطوير المهارات للتحري الموقعي تناول اهم طرق المعالجات الموقعية للأبنية</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. التعرف على العناصر الانشائية المكونة للأبنية للمباني باختلاف أنواعها</li> <li>2. تعريف أسلوب تنفيذ العناصر الانشائية</li> <li>3. شرح ابعاد ومواصفات الوحدات البنائية</li> <li>4. كيفية اجراء الفحوصات الموقعية</li> <li>5. مناقشة مستوى تقييم الاضرار وطرق معالجتها</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>مقدمة عامة عن المباني وانواعها حسب التنفيذ ، الحفريات الترابية واساليبها المختلفة وكيفية تصريف المياه وتجفيف ساحة العمل ، الاملائيات الترابية. [ 6 hr ]</p> <p>اعمال الأسس وطبيعة التربة ، اعمال الركائز وتصنيفها، اعمال الخرسانة ، تلف الخرسانة- المسببات وطرق الوقاية[ 7 hr ] .</p> <p>اكمال وتوصيل الجدران والتمشيط واختيار السمك ، الاعتاب، الاعمدة وتصنيفها[ 5 hr ] .</p> <p>الارضيات والسقوف وأنواع الاحمال المسلطة ، اعمال القوالب وطريقة تصميم القالب الخشبي ز [ 5 hr ]</p> <p>خطوات تقييم الاضرار في المنشآت وتشخيص الاسباب واعداد تقرير الفحص والمعانة البصرية. [ 5 hr ]</p> <p>الفحوصات الموقعية والمختبرية المعتمدة في تقييم الاضرار في المنشآت. [ 5 hr ]</p> <p>مانع الرطوبة وطرق قطع الرطوبة للجدران والارضيات والسراديب. [ 5 hr ]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	الاستراتيجية الأساسية التي هي تشجيع الطالب للاطلاع ومناقشة المراحل الانشائية وكيفية التحري الموقعي من خلال التعليم التفاعلي وأسلوب عرض المشكلة والحلول المناسبة لها
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## Student Workload (SWL)

### الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	48	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطلاب أسبوعيا	3
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطلاب خلال الفصل	27	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطلاب خلال الفصل	75		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	30% (10)	2,5,10	LO #1, 2, 3 and 5
	Assignments	1	6% (10)	8	LO # 1,2, and 5
	Projects / Lab.	0	0% (0)	Continuous	All
	Report	1	4% (10)	3	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	9	LO # 2,4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	Material Covered
Week 1	مقدمة عامة عن المباني وانواعها حسب التنفيذ ( بناء هيكل ، بناء غير هيكل و البناء المشترك )
Week 2	الحفريات الترابية واساليبها المختلفة وكيفية تصريف المياه وتجفيف ساحة العمل
Week 3	الاملائيات الترابية
Week 4	اعمال الأسس وطبيعة التربة وعلاقتها بالأسس وأنواع النزول
Week 5	اعمال الركائز وتصنيفها حسب النوع وحسب موادها وطرق تنفيذها
Week 6	اعمال الخرسانة وأسلوب نقلها ورسها
Week 7	اسباب تضرر الخرسانة- المسببات وطرق الوقاية.
Week 8	اكمال وتوصيل الجدران والتمشيط واختيار السمك
Week 9	الاعتاب ( أنواع الاعتاب والمسنمات الحديدية )
Week 10	الاعمدة (تصنيف الاعمدة الخرسانية والمعدنية ) ، الارضيات والسقوف وأنواع الاحمال المسلطة
Week 11	اعمال القوالب وطريقة تصميم القالب الخشبي
Week 12	انهاء المفاصل البنائية والمواد الرابطة
Week 13	خطوات تقييم الاضرار في المنشآت وتشخيص الاسباب واعداد تقرير الفحص والمعينة البصرية
Week 14	الفحوصات الموقعية والمختبرية المعتمدة في تقييم الاضرار في المنشآت
Week 15	مانع الرطوبة وطرق قطع الرطوبة للجدران والارضيات والسرديب
Week 16	Preparatory week before the final Exam

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?

Required Texts	انشاء المباني تاليف ارتين ليفون وزهير ساكو	Yes

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

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Concrete Technology II	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE209		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII		
Administering Department	CE	College	ENG
Module Leader	Dr. Sufyan Younis Ahmad	e-mail	<a href="mailto:sofyan1975@uomosul.edu.iq">sofyan1975@uomosul.edu.iq</a>
Module Leader's Acad. Title	Assistance Professor	Module Leader's Qualification	Ph.D.
Module Tutors	Zeena Adel Mohammed Roua Suhail Zidan Riffa dalli hamad	e-mail	<a href="mailto:zena.adal@uomosul.edu.iq">zena.adal@uomosul.edu.iq</a> <a href="mailto:rouasuhail@uomosul.edu.iq">rouasuhail@uomosul.edu.iq</a> <a href="mailto:Reffashlla@uomosul.edu.iq">Reffashlla@uomosul.edu.iq</a>
Peer Reviewer Name	Dr. Sufyan Younis Ahmad	e-mail	<a href="mailto:sofyan1975@uomosul.edu.iq">sofyan1975@uomosul.edu.iq</a>
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

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

أ.م.د. نساء جبار محمود  
رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Finding bleeding and plastic shrinkage in fresh concrete.</li><li>2. Identifying the properties of hardened concrete.</li><li>3. Identifying Factors affecting the properties of hardened concrete</li><li>4. Study the effect of w/c ratio on concrete strength and durability.</li><li>5. Study the effect of test conditions on concrete strength.</li><li>6. Study the effect of cement type and aggregate nature on concrete strength.</li><li>7. Methods to measure tensile strength of hardened concrete and its relation with compressive strength.</li><li>8. Calculating the modulus of elasticity of concrete according to different international codes.</li><li>9. Calculating the drying shrinkage in concrete and its effect on durability.</li><li>10. Design of concrete mix based on ACI Method.</li><li>11. Acceptance of compressive strength results respect to Iraqi Code.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Identify the unhealthy effect of bleeding and plastic shrinkage on the properties of concrete.</li><li>2. Identifying the effect of (high and low) water content on the concrete strength and durability.</li><li>3. Identifying the effect of cement type and aggregate nature on the concrete strength and durability.</li><li>4. Calculating the modulus of elasticity and tensile strength of concrete using (ACI and BS) equations and ASTM specification.</li><li>5. Determining the drying shrinkage strain of concrete.</li><li>6. Learn how to design concrete mixture based on ACI Method.</li><li>7. Learn how to evaluate the concrete strength results according to IQS Code.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p><b>Indicative content includes the following.</b></p> <p><b><u>Part A – Concrete Technology II / Theory</u></b></p> <p>Bleeding and plastic shrinkage in fresh concrete. [7 hrs] Properties of hardened concrete and Factors affecting on the concrete properties. [7 hrs] Effect of w/c ratio, and the conditions at test on concrete strength and durability. [7 hrs] Effect of cement type and aggregate nature on concrete strength. [7 hrs] Methods to measure tensile strength of hardened concrete and its relation with compressive strength. [7 hrs] Calculating the modulus of elasticity of concrete according to different international codes. [4 hrs] Design of concrete mix based on ACI code Method. [7 hrs] Acceptance of compressive strength results respect to IQS Code. [4 hrs]</p>

	<p><b>Part B – Concrete Technology II / Lab</b></p> <p>Writing a good technical report [5 hrs]</p> <p>Testing the fresh concrete for Temperature, unit weight, slump, and bleeding of concrete specimens. [4 hrs]</p> <p>Testing the strength of cured concrete samples at a standard age of 28 day, effect of capping of concrete cylinder on the compressive strength, and Effect of shape (standard cylinder and cube) of the concrete specimens on the compressive strength. [8 hrs]</p> <p>Test of flexural tensile strength (one and two points loads). [3hrs]</p> <p>Non-destructive testing of concrete (Hammer, ultrasonic test) and destructive testing of concrete (Core and loading test). [8 hrs]</p> <p>ACI design method and making trial mix. [2hrs]</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	14% (10)	3, 8	LO #1, 3, and 4
	<b>Assignments</b>	2	6% (10)	5, 8	All

	<b>Projects / Lab.</b>	1	10% (10)	weekly	All
	<b>Report</b>	1	10% (10)	13	LO # 3, and 4
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-3
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Finding bleeding and plastic shrinkage in fresh concrete.
<b>Week 2</b>	Identifying the properties of hardened concrete.
<b>Week 3</b>	Identifying Factors affecting the properties of hardened concrete.
<b>Week 4</b>	Effect of w/c ratio on the properties of hardened concrete.
<b>Week 5</b>	Study the effect of test conditions on concrete strength.
<b>Week 6</b>	Study the effect of cement type, fineness of cement, and aggregate nature on concrete strength.
<b>Week 7</b>	Effect of curing conditions and temperature on the properties of hardened concrete.
<b>Week 8</b>	Factors affecting compression & tensile in concrete and conversion between different ages.
<b>Week 9</b>	Measuring the tensile strength of hardened concrete and its relation with compressive strength.
<b>Week 10</b>	Relation between Compression and Tensile strength of concrete.
<b>Week 11</b>	Drying Shrinkage of concrete.
<b>Week 12</b>	Calculating the modulus of elasticity of concrete according to different codes.
<b>Week 13</b>	Calculating drying shrinkage of concrete.
<b>Week 14</b>	Design of concrete mix based on ACI Method.
<b>Week 15</b>	Acceptance of compressive strength results respect to IQS Code

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: Review writing a good technical report.
<b>Week 2</b>	Lab 2: Slump test of fresh concrete, making and curing concrete test specimens.
<b>Week 3</b>	Lab 3: Temperature and unit weight measurement of freshly mixed concrete.
<b>Week 4</b>	Lab 4: Bleeding measurement of freshly mixed concrete..
<b>Week 5</b>	Lab 5: Testing the compressive strength of hardened concrete samples and finding the effect of shape (standard cylinder and cube) of the concrete specimens on the strength.
<b>Week 6</b>	Lab 6: Effect of capping of cylinder on the compressive strength.
<b>Week 7</b>	Lab 7: Testing the flexural tensile strength (one and two points load).
<b>Week 8</b>	Lab 8: Midterm Exam.

<b>Week 9</b>	Lab 9: Non-destructive testing of concrete (Hammer test).
<b>Week 10</b>	Lab 10: Non-destructive testing of concrete (ultrasonic test).
<b>Week 11</b>	Lab 11: Destructive testing of concrete (Core test and loading test).
<b>Week 12</b>	Lab 12: Retarders and Accelerators additives.
<b>Week 13</b>	Lab 13: Fiber reinforced concrete
<b>Week 14</b>	Lab 14: Effect of recycled coarse aggregate in concrete.
<b>Week 15</b>	Lab 15: making trial mix according to ACI design method.

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Composition and properties of concrete ( Troxell)	Yes (Text Book)
<b>Recommended Texts</b>	Properties of Concrete (M. Neville)	Yes
<b>Websites</b>	N/A	

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (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 (0 - 49)</b>	<b>FX</b> – Fail	راسب (فيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Surveying II	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE210		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGII		
Administering Department	CE	College	ENG
Module Leader	Yezin A. Alnajjar	e-mail	<a href="mailto:yazinalnajjar@uomosul.edu.iq">yazinalnajjar@uomosul.edu.iq</a>
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Zeena A. Al-Kazzaz	e-mail	<a href="mailto:Zeena.kazzaz@uomosul.edu.iq">Zeena.kazzaz@uomosul.edu.iq</a>
Peer Reviewer Name	Yezin A. Alnajjar	e-mail	<a href="mailto:yazinalnajjar@uomosul.edu.iq">yazinalnajjar@uomosul.edu.iq</a>
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	

أ.م.د. نداء نجار محمود  
رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Objectives</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. To develop problem solving skills and understanding of surveying theory through the application of techniques.</li> <li>2. To understand measurements.</li> <li>3. This course deals with the basic concept of surveying.</li> <li>4. This is the basic subject for surveying.</li> <li>5. To understand angles and bearings problems.</li> <li>6. To perform surveying.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Recognize how to do angle measurements.</li> <li>2. List the various terms associated with surveying.</li> <li>3. Summarize what is meant by surveying.</li> <li>4. Discuss the bearings.</li> <li>5. Explain the coordinates.</li> <li>6. Define Total station.</li> <li>7. Identify the basic total station applications.</li> <li>8. Define GPS basics.</li> <li>9. Identify basic GPS applications.</li> <li>10. Explain Area surveying.</li> <li>11. Explain Volume surveying.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A- Course Theory</u></p> <p>Theodolite definition- types, history. Angle types- horizontal and vertical, face right and face left, positive and negative vertical angles, drawing the right shapes, clockwise and counterclockwise angles. [10 hrs]</p> <p>Naming convention of horizontal angles, one letter, three letter, closed and open traverse, Sum of internal angles. Bearings of lines. North determination. Departure and latitude. Coordinates (XYZ, ENH). Traverse errors and correction. Theodolite for coordinates. [12 hrs]</p> <p>Total station, components, types,,Prism and Non-Prism. Robotic and smart stations, TLS, point clouds, [6 hrs]</p> <p>GPS, types and segments. Sources of errors. Sky Plot. [4 hrs]</p> <p>Area measurements, from longitudinal and cross sections, from contours and spot heights, using trapezoidal and simpson methods. Volume calculations. [8 hrs]</p> <p>Revision problem classes [5 hrs]</p> <p><u>Part B. Lab</u></p> <p>Introduction to theodolites, setting, leveling, centering, orientation. measuring horizontal and vertical angles. Traversing. [14 hrs]</p>

	Total station surveying. Survey of new coordinates, setting out, intersection. [5 hrs]
	GPS surveying, Sky plot, waypoints. Route. [5 hrs]
	Area calculations. Volume calculations. [6 hrs]

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple activities that are interesting to the students.
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### Student Workload (SWL)

#### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

### Module Evaluation

#### تقييم المادة الدراسية

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

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

<b>Material Covered</b>
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<b>Week 1</b>	Introduction to Theodolites
<b>Week 2</b>	Angle types
<b>Week 3</b>	Theodolite setup
<b>Week 4</b>	Bearing types and conversions
<b>Week 5</b>	Coordinates
<b>Week 6</b>	Open and closed traverse
<b>Week 7</b>	Trigonometric leveling
<b>Week 8</b>	Midterm Examination
<b>Week 9</b>	Total Station and laser scanning
<b>Week 10</b>	GPS Surveying
<b>Week 11</b>	Areas
<b>Week 12</b>	Areas using coordinates
<b>Week 13</b>	Volumes
<b>Week 14</b>	Volumes, from contours and spot heights
<b>Week 15</b>	Horizontal and vertical curves
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Introduction to theodolites, setting
<b>Week 2</b>	Lab 2: measuring horizontal and vertical angles.
<b>Week 3</b>	Lab 3: traversing
<b>Week 4</b>	Lab 4: total station surveying
<b>Week 5</b>	Lab 5: gps surveying
<b>Week 6</b>	Lab 6: Area calculations
<b>Week 7</b>	Lab 7: Volume calculations

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Kavanagh, Barry and Diane K. Slattery. Surveying with Construction Applications. 8th ed., Pearson Education, Inc., 2014.	Yes

<b>Recommended Texts</b>	Kavanagh, Barry and Diane K. Slattery. Surveying with Construction Applications. 8th ed., Pearson Education, Inc., 2014.	No
<b>Websites</b>	<a href="https://www.coursera.org/browse/physical-science-and-engineering/civil-engineering">https://www.coursera.org/browse/physical-science-and-engineering/civil-engineering</a>	

<b>Grading Scheme</b> مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (50 - 100)	<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</b> (0 - 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

## MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer 2	Module Delivery	
Module Type	B	<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	UOM2032		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGII		
Administering Department	Civil Engineering	College	College of Engineering
Module Leader	Dr. Nadiya sadeek Al Saffar	e-mail	<a href="mailto:Nadiya.alsaffar@uomosul.edu.iq">Nadiya.alsaffar@uomosul.edu.iq</a>
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification	Doctor
Module Tutor	Dr. Nadiya sadeek Al Saffar	e-mail	Nadiya.alsaffar@uomosul.edu.iq
Peer Reviewer Name	Dr. Sufyan Younis Ahmad	e-mail	<a href="mailto:sofyan1975@uomosul.edu.iq">sofyan1975@uomosul.edu.iq</a>
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	

  
 أم. د. نداء جبار محمودة  
 رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	Students successfully completing this course will be able to: 1. Utilize the computer for fundamental tasks. 2. Identify and discuss the hardware components of the computer system. 3. Creating documents using a word processor and creating presentations. 4. Conducting research on the Internet. 5. An introduction to Artificial Intelligence
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	Students successfully completing this course will be able to: 1. Utilize the computer for fundamental tasks. 2. Identify and discuss the hardware components of the computer system. 3. Creating documents using a word processor and creating presentations. 4. Conducting research on the Internet. 5. An introduction to Artificial Intelligence
<b>Indicative Contents</b> المحتويات الإرشادية	<p><b>security and Networking:</b> What is a network? Types of networks. Basic network components. Network Security Basics. Understanding network threats. Network Troubleshooting</p> <p><b>E-Commerce:</b> Concepts of Electronic banking services this include online banking: ATM and debit card services, Phone banking, SMS banking, electronic alert, Mobile banking</p> <p><b>Computer Troubleshooting:</b> Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues.</p> <p><b>Introduction to AI: Definition of AI, History of AI, AI Techniques and Approaches, Challenges and Ethical Considerations.</b></p> <p><b>AI in Our Daily Lives:</b> AI in smartphones and virtual assistants like Siri or Google Assistant.)</p> <p><b>Ethical Challenges in AI :</b>(AI ethics, privacy and surveillance, the impact of AI on the job market.)</p> <p><b>The Future of AI</b> (Future trends in AI, recent research and emerging technologies.)</p>

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' participation in the Lab activities, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, laboratory and by considering type of external search involving some of computer technology that are interesting to the students.
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعاً			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	48	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	3
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	75		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	1	20% (10)	4, 11	LO #Q1: 1-2, Q2: 7-9
	<b>Assignments</b>	1	5% (5)	3, 10	LO #A1: 1-2, A2: 7-9
	<b>Lab.</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	5% (5)	14	All
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	9	LO # 1-5
	<b>Final Exam</b>	3hr	50% (50)		
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	<b>security and Networking:</b> What is a network? Types of networks. Basic network components. Network Security Basics. Understanding network threats. Network Troubleshooting
<b>Week 2</b>	<b>E-Commerce:</b> Concepts of Electronic banking services this include online banking: ATM and debit card services, Phone banking, SMS banking, electronic alert, Mobile banking
<b>Week 3</b>	<b>Computer Troubleshooting:</b> Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues.
<b>Week 4</b>	<b>Introduction to AI: Definition of AI, History of AI, AI Techniques and Approaches, Challenges and Ethical Considerations.</b>
<b>Week 5</b>	<b>AI in Our Daily Lives:</b> AI in smartphones and virtual assistants like Siri or Google Assistant.)
<b>Week 6</b>	<b>Applications of AI:</b> Education, Healthcare, Finance, Transportation, Marketing and Advertising.

<b>Week 7</b>	<b>AI and Society:</b> (How AI affects social, AI and international relations, AI and the future of humanity.)
<b>Week 8</b>	<b>Ethical Challenges in AI :</b> (AI ethics, privacy and surveillance, the impact of AI on the job market.)
<b>Week 9</b>	<b>The Future of AI</b> (Future trends in AI, recent research and emerging technologies.)
<b>Week 10</b>	
<b>Week 11</b>	
<b>Week 12</b>	
<b>Week 13</b>	
<b>Week 14</b>	
<b>Week 15</b>	
<b>Week 16</b>	

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

	<b>Material Covered</b>
<b>Week 1, 2</b>	<b>Security and Networking:</b> What is a network? Types of networks. Basic network components. Network Security Basics. Understanding network threats. Network Troubleshooting
<b>Week 3, 4</b>	<b>E-Commerce:</b> Concepts of Electronic banking services this include online banking: ATM and debit card services, Phone banking, SMS banking, electronic alert, Mobile banking
<b>Week 5</b>	<b>Computer Troubleshooting:</b> Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues.
<b>Week 6</b>	<b>Introduction to AI: Definition of AI, History of AI, AI Techniques and Approaches, Challenges and Ethical Considerations.</b>
<b>Week 7, 8</b>	<b>AI in Our Daily Lives:</b> AI in smartphones and virtual assistants like Siri or Google Assistant.)
<b>Week 9</b>	<b>Applications of AI:</b> Education, Healthcare, Finance, Transportation, Marketing and Advertising.
<b>Week 10</b>	<b>AI and Society:</b> (How AI affects social, AI and international relations, AI and the future of humanity.)
<b>Week 11</b>	<b>Ethical Challenges in AI :</b> (AI ethics, privacy and surveillance, the impact of AI on the job

	market.)
<b>Week 12</b>	<b>The Future of AI</b> (Future trends in AI, recent research and emerging technologies.)
<b>Week 13</b>	
<b>Week 14</b>	
<b>Week 15</b>	

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Graham <b>Brown</b> , David Watson, "Cambridge IGCSE Information and Communication Technology", 3rd Edition (2020)	
<b>Recommended Texts</b>	Alan Evans, Kendall Martin, Mary Anne Poatsy, "Technology In Action Complete", 16th Edition (2020).	
<b>Websites</b>		

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (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 (0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language-2	Module Delivery	
Module Type	S	<b>Theory</b> <input checked="" type="checkbox"/> Lecture <b>Lab</b> <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	UOM2022		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UGII		
Administering Department	CE	College	ENG
Module Leader	Rahma Ethar Abdulkareem	e-mail	Rahma.aithar@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Rahma Ethar Abdulkareem	e-mail	
Peer Reviewer Name	Amina Ahmed	e-mail	<a href="mailto:Amina.alshumam@uomosul.edu.iq">Amina.alshumam@uomosul.edu.iq</a>
Scientific Committee Approval Date	2025-9-1	Version Number	1.0

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

أ.م.د. رانيا جبار محمود  
رئيس قسم الهندسة المدنية



<b>Module Aims, Learning Outcomes and Indicative Contents</b> أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. Study grammar, (verb tenses, structure sentence, question words, adverbs and adjectives, quantity, articles, verb pattern, prepositions, comparative and superlative).</li> <li>2. Learn Vocabulary, focus on all academic words specifically in environmental engineering field.</li> <li>3. Study comprehensive reading in variety subjects.</li> <li>4. Focus on listening and speaking using videos and conversation between students in class.</li> <li>5. Study how to write an academic paragraph.</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Learn grammar specifically that help student to write and speak.</li> <li>2. Learn new vocabulary and focus on academic word that related in environmental engineering field.</li> <li>3. Learn the comprehensive reading.</li> <li>4. Practice more on listening and speaking.</li> <li>5. Learn how to write an academic paragraph.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>– <u>English Language</u></p> <p>Grammar/ Verb tenses and examples, structure sentence, question words, adverb and adjectives, articles, quantity, phrasal verbs, and comparative &amp; superlatives, and certainty. [18 hrs.]</p> <p>Practice on comprehensive reading. [4 hrs.]</p> <p>Practice on Listening and Speaking. [4 hrs.]</p> <p>Writing an academic paragraph and paraphrasing. [6hrs.]</p>

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

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	50		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	8.11	LO #1, 3, and 5
	<b>Assignments</b>	2	10% (10)	2, 5, 8, 12	All
	<b>Onsit Assignments</b>	1	10%		
	حلقات دراسية	1	10		
<b>Summative assessment</b>	<b>Midterm Exam</b>	1 hr	10% (10)	9	LO # 1-3
	<b>Final Exam</b>	3hr	50% (60)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Grammar / Verb tenses and examples (present, past, future) / Vocabulary / Reading, listening, speaking
<b>Week 2</b>	Grammar/ Verb tenses and examples (present) / Vocabulary / Reading, listening, speaking
<b>Week 3</b>	Grammar/ Verb tenses and examples (past) / Vocabulary / Reading, listening, speaking
<b>Week 4</b>	Grammar/ Quantity/ Vocabulary / Reading, listening, speaking
<b>Week 5</b>	Grammar/ Verb tenses and examples (future) / Vocabulary / Reading, listening, speaking
<b>Week 6</b>	Grammar/ Comparative & Superlatives / Vocabulary / Reading, listening, speaking
<b>Week 7</b>	Grammar/ Verb tenses and examples (present perfect) / Vocabulary / Reading, listening, speaking
<b>Week 8</b>	Grammar/ have to, should / Vocabulary / Reading, listening, speaking
<b>Week 9</b>	Midterm Exam
<b>Week 10</b>	Grammar/ Verb tenses and examples (past perfect) / Vocabulary / Reading, listening, speaking

<b>Week 11</b>	Grammar/ Verb tenses and examples (passive) / Vocabulary / Reading, listening, speaking
<b>Week 12</b>	Grammar/ Verb tenses and examples (present perfect continuous) / Vocabulary / Reading, listening, speaking
<b>Week 13</b>	Writing an academic paragraph / Reading, listening, speaking
<b>Week 14</b>	Grammar/ if condition / Vocabulary / Reading, listening, speaking
<b>Week 15</b>	Writing / Paraphrasing / Reading, listening, speaking

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Headway Pre-Intermediate Student's Book-Fourth Edition	Yes (text book)
	Headway Pre-Intermediate Student's Book-Fourth Edition	Yes
<b>Websites</b>	<a href="https://meet.google.com/yof-ngkn-ssc">https://meet.google.com/yof-ngkn-ssc</a>	

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (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 (0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Differential Equations	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE301		
ECTS Credits	4.00		
SWL (hr/sem)	100		
Module Level	UGIII		
Administering Department	Civil Dep.	College	College of Engineering
Module Leader	Dr. Salwa Mubarak Abdullah	e-mail	Salwa_hano@uomosul.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Nadiya Sadeek Alsaffar	e-mail	Nadiya.alsaffar@uomosul.edu.iq
Peer Reviewer Name	Amina A Khaleel	e-mail	amina.alshumam@uomosul.edu.iq
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	

أ.د. براءه جبار محمود  
رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. To develop problem solving skills and understanding of differential equations through the application of techniques.</li> <li>2. To make students familiar with second order differential equation, higher order linear differential equation, differential equation system, characteristic values, characteristic vector</li> <li>3. This course deals with Fourier series, half-range expansions of odd and even functions</li> <li>4. This is the basic subject for simultaneous solving of differential equations using the D operator to make the student able to understand and start Use of mathematical equations.</li> <li>5. To make the students familiar with the use of numerical methods to solve equations, including iterative methods, how to find the completion in different ways.</li> <li>6. To perform numerical integration and numerical derivative.</li> <li>7. the use of matrices to solve the system of equations in different ways, as well as using the numerical solution to solve first and second degree differential equations in numerical ways.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Apply basic mathematics, science and engineering principles to solve engineering problems.</li> <li>2. To introduce different techniques for solving some differential equations</li> <li>3. To enable students to use and apply these techniques in civil engineering applications</li> <li>4. To enable students to use some well-known programs as a tool to help solve differential equations.</li> <li>5. Discuss the use of Fourier series in engineering application.</li> <li>6. Discuss the second order differential equation, higher order linear differential equation, differential equation system, characteristic values, characteristic vector</li> <li>7. List the various method for solving equations by iteration.</li> <li>8. Summarize what is meant by numerical integration and differentiation.</li> <li>9. the student able to understand and start Use of mathematical equations to solve simultaneous differential equations.</li> <li>10. To understand the methods of interpolation and be able of applying it when it is necessary in practical work.</li> <li>11. Identify the methods of solving system of equations.</li> <li>12. Discuss the methods of obtaining curve fitting.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Differential Equations</u></p> <p>Second order Linear Differential Equation. Solve Problems and applications Higher Order Linear Differential Equation. Solve Problems and applications. Eigen value and Eigen vectors, Solution of simultaneous DES using the operator D. Fourier Series and solve problems. Even and odd function half range expansions. Fourier series Applications [25 hrs]</p> <p>Partial Differential Equation, Wave Equation, Solve Problems and applications, Partial</p>

	Differential Equation, Heat Equation, Solve Problems and applications. Free Longitudinal Vibration on Beams, Solve Problems and applications. Free Transverse Vibration on Beams, Solve Problems and applications. Partial Differential Equation, Laplace Equation, Solve Problems and applications. [20 hrs]
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### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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### Student Workload (SWL)

#### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	75	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	25	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> 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	32% (32)	3, 10	LO # 1, 2
	<b>Assignments</b>	2	5% (5)	2, 12	LO # 1, 2
	<b>Projects / Lab.</b>	1	0% (0)	Continuous	All
	<b>Report</b>	1	3% (3)	13	LO # 1,2
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-2
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Second-order Linear Differential Equation.
Week 2	Solve Problems and applications of Higher Order Linear Differential Equations.
Week 3	Applications.
Week 4	Solved problems.
Week 5	Matrices and determinants
Week 6	Eigenvalue and Eigen vectors.
Week 7	Solution of simultaneous DES using the operator D
Week 8	Fourier series, even and odd function half-range expansions
Week 9	Fourier Series Applications
Week 10	Fourier Series Applications
Week 11	Partial Differential Equation, Wave Equation, Solve Problems, and Applications
Week 12	Partial Differential Equation, Heat Equation, Solve Problems, and Applications
Week 13	Free Longitudinal Vibration on Beams, Solve Problems, and Applications
Week 14	Free Transverse Vibration on Beams: Solve Problems and Applications
Week 15	Partial Differential Equation, Laplace Equation, Solve Problems, and Applications
Week 16	<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?
<b>Required Texts</b>	<ol style="list-style-type: none"> <li>1. Erwin Kreyszig, "Advanced engineering mathematics" John wiley &amp; sons, sixth edition, 1988</li> <li>2. C. Ray Wylie, " Advanced engineering mathematics" McGRAW-Hill ,INC, Ltd., fourth edition, 1975.</li> <li>3. Kiusalaas, " Numerical Methods in Engineering with MATLAB", Campridge University press, 2005.</li> </ol>	Yes
<b>Recommended Texts</b>	<ol style="list-style-type: none"> <li>1. Erwin Kreyszig, "Advanced engineering mathematics" John wiley &amp; sons, sixth edition, 1988</li> </ol>	No
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (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 (0 - 49)</b>	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Theory of Structures I		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CE302		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII	Semester of Delivery	
Administering Department	Civil engineering	College	College of engineering
Module Leader	Dr. Oday Asal Salih	e-mail	odaycivileng@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Jasim Ali Abdullah	e-mail	jassim24676@uomosul.edu.iq
Peer Reviewer Name	Dr. Suhaib Y Al-darzi	e-mail	suhaib.qasim@uomosul.edu.iq
Scientific Committee Approval Date	1-9-2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mechanics of Materials II	Semester	4
Co-requisites module	Theory of Structures II	Semester	6

أ.د. براء جبار محمود  
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## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	Students are introduced to the engineering elements of structures through the study of the creation and types of structures. Following this, students' knowledge as potential civil engineers is gradually expanded so that they are able to assess determinate structures and determine whether or not these structures are stable. Calculations of the deformations of determinate structures will be covered in this course using the virtual work approach, Casigliano's first theorem, and the conjugate beam method. Finally, drawing the influence lines of determinate structures (beams, trusses, and girders) will be covered in this course.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1- Be able to classify the structures.</li><li>2- Gain the ability to analyze the determinate structures (Beams, Frames, and Trusses).</li><li>3- Draw the shear force and moment diagrams (Beams, Frames).</li><li>4- Determine the deformations of determinate structures (Beams, Frames, and Trusses) by different methods.</li><li>5- Make the student draw the influence lines of determinate structures (Beams, Trusses, and Girders).</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>Introduction of the theory of structures and general discussion of the stability of structures. Discuss the stability and determinacy of Beams, Frames and Trusses [10 hrs].</p> <p>Analysis of statically determinate Beams and draw the shear forces and moments diagrams. Analysis of statically determinate Frames and draw the normal force, shear forces and moments diagrams [10 hrs].</p> <p>Analysis the determinate Trusses by Joint Method. Analysis the determinate Trusses by Section Method [10 hrs].</p> <p>Deformations of Beams By Virtual Work Method. Deformations of Frames By Virtual Work Method. Deformations of Trusses By Virtual Work Method [10 hrs].</p> <p>Deformations of Beams &amp; Frames By Castigliano's First Theorem Method. Deformations of Trusses By Castigliano's First Theorem Method [10 hrs].</p> <p>Deformations of Beams By Conjugate Beam Method [10 hrs].</p> <p>Influence Lines of Beams. Influence Lines of Trusses. Influence Lines of Girders [15 hrs].</p>
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	The primary approach that will be used to present this module is to promote student engagement in the activities while also enhancing and broadening their critical thinking abilities. Classes, interactive tutorials, and straightforward experiments with a few fun sampling exercises will be used to do this.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدر اسي الكلي للطالب خلال الفصل	150		

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

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Introduction of the theory of structures and general discussion of the stability of structures.
<b>Week 2</b>	Discuss the stability and determinacy of Beams, Frames and Trusses.
<b>Week 3</b>	Analysis of statically determinate Beams and draw the shear forces and moments diagrams.
<b>Week 4</b>	Analysis of statically determinate Frames and draw the normal force, shear forces and moments diagrams.
<b>Week 5</b>	Analysis the determinate Trusses by Joint Method.
<b>Week 6</b>	Analysis the determinate Trusses by Section Method.

<b>Week 7</b>	Design of tension members. Selection of sections
<b>Week 8</b>	Deformations of Beams By Virtual Work Method. Deformations of Frames By Virtual Work Method.
<b>Week 9</b>	Deformations of Trusses By Virtual Work Method
<b>Week 10</b>	Deformations of Beams & Frames By Castigliano's First Theorem Method.
<b>Week 11</b>	Deformations of Trusses By Castigliano's First Theorem Method
<b>Week 12</b>	Deformations of Beams By Conjugate Beam Method
<b>Week 14</b>	Influence Lines of Trusses.
<b>Week 15</b>	Influence Lines of Girders.
<b>Week 16</b>	Final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Structural Analysis, Russell C. Hibbeler, Pearson Education Limited, 10 <sup>th</sup> edition, 2020.	No
<b>Recommended Texts</b>	Structural Analysis, Aslam Kassimali Cengage Learning, 6 <sup>th</sup> edition, 2019.	No
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (50 - 100)	<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</b> (0 – 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Soil mechanics I	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE303		
ECTS Credits	6.00		
SWL (hr/sem)	150		
Module Level	UGIII		
Administering Department	Civil Eng. Dep.	College	College of Engineering
Module Leader	Dr. Moataz A. Al-Obyadi Amina A Khaleel	e-mail	E-mail: <a href="mailto:dralobaydi@uomosul.edu.iq">dralobaydi@uomosul.edu.iq</a> <a href="mailto:amina.alshumam@uomosul.edu.iq">amina.alshumam@uomosul.edu.iq</a>
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Amina A Khaleel Professor	e-mail	E-mail: <a href="mailto:amina.alshumam@uomosul.edu.iq">amina.alshumam@uomosul.edu.iq</a>
Peer Reviewer Name	امينة احمد خليل	e-mail	<a href="mailto:amina.alshumam@uomosul.edu.iq">amina.alshumam@uomosul.edu.iq</a>
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	

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## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>Course aims are to provide students with the necessary background information for soils.</p> <p>By the end of this module, students will be able to:</p> <ol style="list-style-type: none"> <li>1. <b>Knowledge &amp; Understanding</b> <ul style="list-style-type: none"> <li>○ Define fundamental concepts of soil mechanics, including soil composition, states, and basic properties.</li> <li>○ Explain the flow through the soil and its effect on stability of hydraulic stretcher hydraulic characteristics of soils.</li> <li>○ Understanding compaction proses in laboratory and fielded cases</li> </ul> </li> <li>2. <b>Application</b> <ul style="list-style-type: none"> <li>○ Apply soil mechanics principles to solve problems related to phase relationships and soil classification.</li> <li>○ Use standard classification systems to categorize different soil types and assess their suitability for civil engineering applications.</li> </ul> </li> <li>3. <b>Analysis</b> <ul style="list-style-type: none"> <li>○ Analyze flow phenomena in soils, including permeability and seepage, using theoretical and empirical methods.</li> <li>○ Evaluate stress distribution within soil masses and interpret the principle of effective stress.</li> </ul> </li> <li>4. <b>Problem-Solving</b> <ul style="list-style-type: none"> <li>○ Integrate theoretical knowledge with practical case studies to propose solutions for geotechnical engineering problems.</li> <li>○ Calculate the stress distributions in soil media.</li> </ul> </li> <li>5. <b>Evaluation</b> <ul style="list-style-type: none"> <li>○ Assess soil behavior under various engineering conditions and recommend appropriate design considerations.</li> <li>○ Critically evaluate soil data and select suitable parameters for geotechnical analysis.</li> </ul> </li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> <li>a. Explain the fundamental principles of soil behavior, including physical, mechanical, and hydraulic properties.</li> <li>b. Apply soil mechanics theories and methods to solve engineering problems related to water flow, effective stress.</li> <li>c. Conduct laboratory tests using modern soil mechanics equipment and apply standard soil investigation procedures.</li> <li>d. Prepare professional, clear, and concise technical reports in the field of soil mechanics and geotechnical engineering.</li> <li>e. Identify, analyze, and propose solutions for geotechnical problems encountered in the field.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><b>Physical Properties of Soils:</b> This part introduces the fundamental physical properties of soils, including moisture content, density, void ratio, porosity, degree of saturation, and Atterberg limits. <i>[17 hrs]</i></p> <p><b>Seepage and Flow in Soils:</b> Topics include flow net construction, seepage into excavations, seepage forces, and piping phenomena. <i>[22 hrs]</i></p> <p><b>Stress in Soil Masses:</b> Focus on the concept of total stress, effective stress, and pore water pressure, and their implications in soil mechanics. <i>[16 hrs]</i></p> <p><b>Compaction:</b> Basic principles, compaction mechanics and the role of water, basic variables affecting the compaction process, Laboratory compaction, effect of compaction on soil properties. In situ compaction, control of in situ compaction processes. <i>[10 hrs]</i></p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>The course is delivered through a combination of theoretical lectures and laboratory practical sessions. On successful completion, students will be able to:</p> <ol style="list-style-type: none"> <li>1. <b>Explain</b> the multiphase nature of soils and derive quantities related to the volumes and masses of the different phases.</li> <li>2. <b>Apply</b> the effective stress principle to solve basic geotechnical engineering problems.</li> <li>3. <b>Determine and classify</b> soils using standard procedures and classification systems.</li> <li>4. <b>Demonstrate skills</b> in measuring soil permeability and compaction, and in solving seepage-related problems.</li> <li>5. <b>Develop decision-making abilities</b> for addressing practical geotechnical problems in the field.</li> </ol>
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	8% (8)	3, 9	LO # 1 and 2
	<b>Assignments(H.W )</b>	1	9% (9)	8	LO # 2 and 5
	<b>Lab( امتحان + تقرير )</b>	1	10% (10)	Continuous	LO # 3 and 4
	<b>Classwork(5) عملي في المختبر</b>	1	5% (5)	Every week	LO # 3 and 4
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	LO # 1, 2 and 3
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to soil engineering
Week 2	Physico-mechanical properties of soil
Week 3	Soil classification
Week 4	Soil classification
Week 5	Hydraulic properties of soil
Week 6	Flow of water in soils (Permeability & seepage flow)
Week 7	Flow of water in soils (Permeability & seepage flow)
Week 8	Flow of water in soils (Permeability & seepage flow)
Week 9	Flow of water in soils (Permeability & seepage flow)
Week 10	Stresses within soil mass (Internals Stresses )
Week 11	Stresses within soil mass (Internals Stresses & External Stresses)
Week 12	Stresses within soil mass ( External Stresses)
Week 13	Stresses within soil mass ( External Stresses)
Week 14	Soil compaction
Week 15	Soil compaction
Week 16	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1,2	Lab 1: water content - unit weight test- explain Lab 2: water content - unit weight test - training
Week 3,4	Lab 3: specific gravity test- explain Lab 4: specific gravity test - training
Week 5,6	Lab 5: Atterberg limits test- explain Lab 6: Atterberg limits test - training
Week 7,8	Lab 7: Sieve analysis test- explain Lab 8: Sieve analysis test - training
Week 9,10	Lab 9: Hydrometer analysis test- explain Lab 10: Hydrometer analysis test - training
Week 11,12	Lab 11: Permeability test- explain Lab 12: Permeability test- explain test - training
Week 13,14,15	Lab 13: Compaction test. Lab 14: Compaction test.

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	1. "Principles of Geotechnical Engineering", (2004), Braja M. Das, 5th edition 2002, copyright by Wadsworth Group/United Stated. 2. "Principal of Soil Mechanic", (1991), Mohammed O. AL-Asho, (Book language in Arabic).	Yes
<b>Recommended Texts</b>	1. "Elements of Soil Mechanics", (1988), G. N. Smith and Ion G. N. Smith, USA. 2. "Problem Solving in Soil Mechanics", (2003), A. Aysen, Swets & Zeitlinger B.V	No
<b>Websites</b>	No	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (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 (0 - 49)</b>	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Reinforced Concrete I	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE304		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII		
Administering Department	Civil Eng. Dep.	College	College of Engineering
Module Leader	Dr. Rabi. M. Najem	e-mail	dr.rabi.najem@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Halla Jasem Mohamed	e-mail	<a href="mailto:engrehal.1984@uomosul.edu.iq">engrehal.1984@uomosul.edu.iq</a>
Peer Reviewer Name	Dr. Suhaib Y Al-darzi	e-mail	<a href="mailto:suhaib.gasim@uomosul.edu.iq">suhaib.gasim@uomosul.edu.iq</a>
Scientific Committee Approval Date	1-9-2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mechanics of Materials II	Semester	4
Co-requisites module	None	Semester	

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## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>The purpose of the course is to give students the information and abilities needed to develop safe and affordable designs for structural members, with a particular emphasis on beams. To meet the criteria of the ACI 318-19 standard, two design methodologies—the Allowable Stress Method (ASM) and the Ultimate Stress Method (USM)—will be taught. Students will gain knowledge of how to evaluate the structural integrity of beams and choose the proper reinforcement by learning these techniques. Additionally, the course will give students hands-on experience resolving a variety of design and construction issues that could come up on the job site. By the completion of the course, students will be well-equipped to handle practical design issues, resulting in the development of economically sound and stable beam designs.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>Students who successfully complete this course will be able to:</p> <ol style="list-style-type: none"> <li>1. Identify and describe the characteristics and properties of materials used in construction, such as concrete and steel.</li> <li>2. Identify the design methods and their requirements as outlined in the ACI 318-19 (American Concrete Institute) standard.</li> <li>3. The students will learn about designing and analyzing reinforced concrete beams using the Allowable Stress Method (ASM). This method helps determine the required reinforcement, assess bending moments, and ensure the beams meet acceptable stress and deflection limits.</li> <li>4. The students will learn the design and analysis of reinforced concrete beams using the Ultimate Stress Method (USM). This method involves assessing the ultimate strength capacity of the beams and determining the required reinforcement to ensure structural integrity and safety. Also, the students will explore the principles, procedures, and considerations involved in applying the (USM) to analyze and design reinforced concrete beams.</li> <li>5. Students will delve into the topic of shear strength in beams. Shear strength is a crucial aspect of beam design, as it determines the beam's ability to resist shear forces.</li> <li>6. Students will acquire the skills to design for torsion in beams. Torsion is a significant factor in the structural behaviour of beams subjected to twisting forces.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Part I</p> <ul style="list-style-type: none"> <li>- Introduction to reinforced concrete mechanical properties, ACI Code Limitations for beams.</li> <li>- Understanding the behaviour of concrete materials.</li> <li>- Explain reinforced concrete design methods and the behaviour of reinforced concrete</li> </ul>

	<p>sections under different types of failure.</p> <ul style="list-style-type: none"> <li>- methods of analysis and design, analysis and design of different structural members</li> <li>- Explaining the design and analysis of different shapes of reinforced concrete beams under a variety of loading conditions.</li> <li>- The reinforcement arrangements in the reinforced sections.</li> <li>- Solved engineering problems by applying principles of engineering science and mathematics. (30hr)</li> </ul> <p>Part II</p> <ul style="list-style-type: none"> <li>- Introduction to beams</li> <li>- Failure types of beams.</li> <li>- ACI Code limitation for analysis and design of rectangle beams (single and double reinforcement).</li> <li>- ACI Code limitation for analysis and design of T-Shaped section beams (single and double reinforcement).</li> <li>- ACI Code limitation for analysis and design of special section beams.</li> <li>- Solved examples of rectangle beams (single and double reinforcement).</li> <li>- Solved examples of T-shaped section beams (single and double reinforcement).</li> <li>- Solved examples of special section beams (single and double reinforcement). (30hr)</li> </ul> <p>Part III</p> <ul style="list-style-type: none"> <li>- Defining the shear strength and torsion of reinforced concrete beams.</li> <li>- Design for shear reinforcing in reinforced concrete beams.</li> <li>- Design for torsion in reinforced concrete beams.</li> <li>- Solved examples. (15hr)</li> </ul>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering the types of simple experiments involving some sampling activities that are interesting to the students.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b>	150		

الحمل الدراسي الكلي للطالب خلال الفصل	
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Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	20% (20)	4, 13	LO #3, 4, 5, and 6
	Assignments	3	20% (20)	4, 13	LO #3, 4, 5, and 6
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction: Properties of concrete, reinforcing steel, and loads
Week 2	Concrete and Reinforcing Steel
Week 3	Concrete and Reinforcing Steel
Week 4	Design Methods and Requirements
Week 5	Design Methods and Requirements
Week 6	Flexural behavior of beams by working stresses method
Week 7	Allowable Stress Method (A.S.M) analysis of singly and double, tee, and irregularly reinforced sections
Week 8	Allowable Stress Method (A.S.M) design of single and double reinforced sections
Week 9	Allowable Stress Method (A.S.M) design of tee and irregularly reinforced sections
Week 10	Ultimate Stress Method (U.S.M) analysis of singly and double, tee, and irregularly reinforced sections
Week 11	Ultimate Stress Method (U.S.M) design of single and double reinforced sections
Week 12	Ultimate Stress Method (U.S.M) design of tee and irregularly reinforced sections
Week 13	Beam design for shear (Introduction to torsion with code design limitations, Design of beams under shear)
Week 14	Beam design for torsion (Introduction to torsion with code design limitations)
Week 15	Beam design for shear and torsion (Design of beams under shear and torsion with flexural moment)
Week 16	A 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	Basics of Reinforced concrete. Saad Al Taan, 1991	Yes
Recommended Texts	Building Code Requirements for Structural Concrete (ACI 318M-19) and Commentary.	Yes
Websites		

## Grading Scheme

مخطط الدرجات

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

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Highway Engineering I	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE305		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII		
Administering Department	Civil Eng. Dep.	College	College of Engineering
Module Leader	Dr.Mohammed Ahmed	e-mail	mohammad66ah@uomosul.edu.iq
Module Leader's Acad. Title	Ass. Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr.Yazin AbdulIllah Alnagar	e-mail	
Peer Reviewer Name	ا.د. عبد الرحيم ابراهيم جاسم	e-mail	alhadidy@uomosul.edu.iq
Scientific Committee Approval Date	1-9-2025	Version Number	1.0

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

أ.د. براء جبار محمود  
رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	Module aims is to provide students the necessary background information for geometric design of highways their engineering properties, as well as teaching them the engineering behavior of driver, pedestrian, vehicles, and roads.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Understanding of the properties of the driver, pedestrian, vehicles, and roads relating to the geometric design of highways.</li><li>2. Designing the horizontal and vertical curves of the highways.</li><li>3. Designing the cross section elements of the highways.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following:</p> <p><u>Part A - Introduction and Highway route location</u> Importance of Highways. Transportation and Highway History. Transportation Employment. Principles of Highway Location. Highway Survey Methods [2 hrs]</p> <p><u>Part B - Highway Operation</u> Characteristics of the driver. Characteristics of the pedestrian. Vehicle Characteristics [2 hrs]</p> <p><u>Part C – Highway Cross-Section Elements</u> Highway Lanes. Shoulders. Medians. Roadside and Median Barriers. Curbs and Gutters. Guardrails. Cross Slopes. Side Slopes. Right-of-Way. [2 hrs]</p> <p><u>Part D – Sight Distance</u> Stopping Sight Distance. Passing Sight Distance [4 hrs]</p> <p><u>Part E – Horizontal Curves</u> Circular Curves. Compound Curves. Reverse curves. Transition Curves. Pavement widening [12 hrs]</p> <p><u>Part F – Superelevation.</u> [2 hrs]</p> <p><u>Part G – Vertical Curves</u> Crest Curves. Sag Curves. Sight Distance on Vertical Curves. Unsymmetrical vertical curves. [6 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

## Module Evaluation

### 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	All
	<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)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction and Highway route location
Week 2	Highway operation (characteristics of the driver, pedestrian and vehicle)
Week 3	Highway cross section design elements
Week 4	Stopping sight distance
Week 5	Passing sight distance
Week 6	Turning radius
Week 7	Horizontal circular curves
Week 8	Compound and reverse horizontal curves
Week 9	Transition curves
Week 10	Sight distance on circular curves
Week 11	Pavement widening
Week 12	Superelevation
Week 13	Vertical curves
Week 14	Sight distance on vertical curves
Week 15	Unsymmetrical vertical curves
Week 16	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Penetration Test
Week 2	Lab 2: Softening point
Week 3	Lab 3: Ductility test
Week 4	Lab 4: Saybolt viscosity test
Week 5	Lab 5: Specific gravity test
Week 6	Lab 6: Thin film oven test
Week 7	Lab 7: Flash point

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	Traffic and Highway Engineering, Enhanced Fifth Edition, SI Edition, Nicholas J. Garber, Lester A. Hoel, Cengage Learning, Inc., 2020.	Yes
<b>Recommended Texts</b>	A Policy on Geometric Design of Highways and Streets, 7th Edition, American Association of State Highway and Transportation Officials, 2018.	No
<b>Websites</b>	<a href="https://www.highwayengineering">https://www.highwayengineering</a>	


Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (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 (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
<p><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.</p>				

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Project Management	Module Delivery	
Module Type	B	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE306		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UGIII		
Administering Department	Civil engineering Dep.	College	College of Engineering
Module Leader	Dr. Rakan Faruk	e-mail	Rakanalmola75@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	E-mail
Peer Reviewer Name	Amina A Khaleel	e-mail	<a href="mailto:amina.alshumam@uomosul.edu.iq">amina.alshumam@uomosul.edu.iq</a>
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	

  
أ.د. ركان فرح  
رئيس قسم الهندسة المدنية



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	This course covers the fundamental concepts and applied techniques for managing project resources effectively and delivering on schedule. Course content addresses fundamental methods for planning, scheduling, organizing, and controlling projects. Though project management is universally applicable. Students will learn project management principles and methods with special focus on planning, controlling, and managing projects. Course topics will primarily be the technical aspects of project management. Examples include developing the project plan, schedules, and the critical path, resources and resource levelling, MS Project software, S-Curve, and cash flow, & Evaluating Project cost and schedule performance (Earned Value).
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<b>CLO-1:</b> Listing and recognizing project activities and critical paths, bidding document, and contract agreement (i) <b>CLO-2:</b> Understanding the principles of project management and the construction works stages, types of construction contract, management level, and project control (i) <b>CLO-3:</b> Using Microsoft Project software to schedule the project activities, updating projects, levelling the resources, getting reports, & Printing. (ii) <b>CLO-4</b> Integrating the time and cost of the project. (ii). <b>CLO-5</b> Organizing project work progress. (ii) <b>CLO-6:</b> Judging the project efficiency depending on time and budget. (ii) <b>CLO-7:</b> Planning and tracking the project. (ii) <b>CLO-8:</b> Formulating cash flow of projects (ii)
<b>Indicative Contents</b> المحتويات الإرشادية	<u>Part A – Introduction to project management.</u> Definition of the project, Stages of construction project, bidding documents, contract agreement, construction project team, Types of construction contract, management level, project control (9 hrs.) <u>Part B – Project Scheduling.</u> Construction project planning technique, work breakdown structure, task relationship, Determination of project tasks & breaking down the project into tasks. Ghant chart, Scheduling projects using the Critical Path Method, Project time control (Project Updating), Time-cost trade-off. (15 hrs.) <u>Part C MS Project Software</u> Scheduling the project and assigning resources using MS Project software, project updating, and Tracking (12 hrs.) Part D – Formulating S-curve & Project cash flow. Calculate work progress: Evaluating Project cost and schedule performance (Earned Value). (9 hrs.)

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	This course has several components, including lectures, assignments, and exams. Exercises involving the use of MS Project software. The course will be taught in Arabic.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b>	17	<b>Unstructured SWL (h/w)</b>	1

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>50</b>		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	40 % (40)	4 and 12	1 (CLO-1, CLO -2), 2 (ALL)
	<b>Assignments</b>	0	0		
	<b>Projects / Lab.</b>	0	0		
	<b>Report</b>	0	0		
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	8	All
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Introduction, Definition of the project, Aim of project management, and Stages of construction project.
<b>Week 2</b>	Bidding documents, Contract agreement, and Construction project team.
<b>Week 3</b>	Quiz 1, Types of construction contract, Management level, and Project control.
<b>Week 4</b>	Construction project planning technique, Work breakdown structure, Breaking down the project into tasks & Determination of task duration.
<b>Week 5</b>	Task relationship, Ghant chart, Critical path method, and Precedence method.
<b>Week 6</b>	Scheduling by the Critical Path Method.
<b>Week 7</b>	Project time control (Project Updating).
<b>Week 8</b>	Mid-Term Exam, Time-cost trade-off.
<b>Week 9</b>	MS Project software: Introduction, Scheduling projects.
<b>Week 10</b>	MS Project software: Resources allocation and assignment, Schedule updating & Tracking
<b>Week 11</b>	MS Project Software: Reports and Printing
<b>Week 12</b>	MS Project Software: Quiz 2.
<b>Week 13</b>	S-curve & Project cash flow. Work progress calculation
<b>Week 14</b>	Project cost and schedule performance (Earned Value).

<b>Week 15</b>	Project cost and schedule performance (Earned Value).
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

<b>Delivery Plan (Weekly Lab. Syllabus)</b> 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> مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	K. K. Chitkara "Construction Project Management 3rd Edition, Kindle Edition" Mc Graw Hill education, INDIA, 2014.	
<b>Recommended Texts</b>	S. Seetharaman" Construction Engineering and Management fifth edition", UMESH publications, 2015.	
<b>Websites</b>	<a href="https://uomosul.edu.iq/en/engineering/environmental-engineering-dept/">https://uomosul.edu.iq/en/engineering/environmental-engineering-dept/</a>	

<b>Grading Scheme</b> مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
<b>Success Group (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 (0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Hydrology	Module Delivery	
Module Type	B	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE307		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGIII		
Administering Department	Civil. Dep.	College	College of Engineering
Module Leader	Dr. Ayman Talib Hameed	e-mail	ayman.th@uomosul.edu.iq
Module Leader's Acad. Title	Assistant professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	امينة احمد خليل	e-mail	amina.alshumam@uomosul.edu.iq
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	

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## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. To form engineering thinking for students, capabilities to use innovative technical and technological solutions in engineering hydrology application.</li> <li>2. To increase the ability of students to identify, formulate and solve problems in a systematic way.</li> <li>3. This is addressing issues related to water balance and developing hydrological calculation methods and accuracy.</li> <li>4. To explaining the various instruments and methods used to calculate water quantities in surface and subsurface flow.</li> <li>5. Students will understand interaction between hydrologic engineering and surrounding conditions.</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Students will learn the fundamental of hydrology and their applications as well as water resources management.</li> <li>2. The students will learn hydrologic cycle, precipitation and streamflow measurements, aquifer and groundwater and their relationships to engineering designs.</li> <li>3. The students will learn about the surface and subsurface water resources.</li> <li>4. The students will learn theories of unit hydrograph and applications on flood forecast including peak discharge and time of peak occurrence.</li> <li>5. The students will learn theories of flood routing including reservoir and channel routing in flood forecasting.</li> <li>6. Design a system or structure to meet the specific needs resulting from the analyses and interpretation of data.</li> <li>7. Students learn the analysis process to be involved in designing various structural components used in professional structural engineering.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p><b>Indicative content includes the following.</b></p> <p>Introduction, Hydrological cycle, Practical application of Hydrology in engineering. Precipitation, type of precipitation, Measurement of precipitation, Type of gauges. [6 hrs]</p> <p>Preparation of data, double mass curve method, Presentation of rainfall data, Estimating missing precipitation data, Determination of average precipitation over area. Stream flow, Water stage measurement in river, Discharge measurement, Stage-Discharge relationship, Extension of rating curve. [8 hrs]</p> <p>Run Off. Hydrograph, Components of Hydrograph, Factors affecting on hydrograph, Base flow separation, Analysis of complex hydrograph, Unit hydrograph, Derivation of unit hydrograph, Conversion of unit hydrograph, Synthetic unit hydrograph. [8 hrs]</p> <p>Flood routing, Reservoir routing, Channel routing. [4 hrs]</p> <p>Ground water, Wells. [4 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The learning and teaching strategy is designed to provide students with a basic theoretical and practical understanding of the hydrological engineering within the surface, subsurface and ground flow. The learning and teaching methods include question and answer in class allowing students time to reflect on and apply the lecture material and develop problem solving skills.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	75		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	20% (20)	4, 10	LO #1-2, and 5
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 3, and 4
	<b>Projects / Lab.</b>				
	<b>Report</b>	1	10% (10)	13	LO # 6 and 7
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	9	LO # 1-6
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction, Hydrological cycle, Practical application of Hydrology in engineering
<b>Week 2</b>	Precipitation, type of precipitation, Measurement of precipitation, Type of gauges.
<b>Week 3</b>	
<b>Week 4</b>	Preparation of data, double mass curve method, Presentation of rainfall data, Estimating missing precipitation data, Determination of average precipitation over an area
<b>Week 5</b>	Stream flow, Water stage measurement in river, Discharge measurement, Stage-Discharge relationship
<b>Week 6</b>	
<b>Week 7</b>	Extension of the rating curve
<b>Week 8</b>	Run Off
<b>Week 9</b>	Hydrograph, Components of Hydrograph, Factors affecting the hydrograph, Base flow separation, Analysis of complex hydrograph
<b>Week 10</b>	Unit hydrograph, Derivation of unit hydrograph, Conversion of unit hydrograph
<b>Week 11</b>	Synthetic unit hydrograph
<b>Week 12</b>	Flood routing, Reservoir routing
<b>Week 13</b>	Channel routing
<b>Week 14</b>	Ground water
<b>Week 15</b>	Wells
<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>	

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Mohammead soliman et. al., (1992), "Engineering Hydrology" Arabic version, 1st edition, Home books for printer and Publisher –Mosul.	Yes
<b>Recommended Texts</b>	<p>Arora K. R. (2006), "Irrigation, Water Power and Water Recourses Engineering ", 4th Reprint Edition, A. K. Jain, For standard Publishers distributors, 1705-B. Nai Sarak. Delhi-110006.</p> <p>Santosh Kumeear (1999), "Irrigation Engineering and Hydraulic Structures", 14th Reviere edition in S.I. Units, Hanna Publishers,2-B. Nathmarket. Naisarak, Delhi-110006.</p> <p>Irrigation, Water Power and Water Recourses Engineering, Dr. K. R. Arora, 4th Reprint Edition 2006.</p> <p>Madan Mohan Das and Mimi Das Saikia "Hydrology", 2023, by PHI Learning private limited, Delhi.</p>	No
<b>Websites</b>		


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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Numerical Analysis		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CE308		
ECTS Credits	4.00		
SWL (hr/sem)	100		
Module Level	UGIII	Semester of Delivery	
Administering Department	Civil Eng. Dep.	College	College of Engineering
Module Leader	Dr. Salwa Mubarak Abdullah	e-mail	Salwa_hano@uomosul.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Nadiya Sadeek Alsaffar	e-mail	Nadiya.alsaffar@uomosul.edu.iq
Peer Reviewer Name	Amina A Khaleel	e-mail	amina.alshumam@uomosul.edu.iq
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	

  
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## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. To develop problem solving skills and understanding of numerical analysis through the application of techniques.</li><li>2. To make students familiar with the use of numerical methods to solve equations, including iterative methods, how to find the completion in different ways.</li><li>3. This course deals with numerical integration and numerical differentiation, and the use of matrices to solve systems of equations in different ways.</li><li>4. This is the basic subject for the numerical solution of first and second-degree differential equations in numerical ways</li><li>5. To make the students familiar with the MATLAB Program to solve problems and find solutions in different ways.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Apply basic mathematics, science, and engineering principles to solve engineering problems.</li><li>2. To introduce different techniques for solving some differential equations</li><li>3. To enable students to use and apply these techniques in civil engineering applications</li><li>4. To enable students to use some well-known programs like MATLAB as a tool to help solve differential equations.</li><li>5. Discuss the use of interpolation methods in engineering applications.</li><li>6. Discuss the numerical solution to solve first and second-degree differential equations in numerical ways</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Numerical Analysis</u></p> <p>Numerical Methods in General, Introduction, Solution of Equations by Iteration, fixed point iteration method, Newton-Raphson method, and Secant method, Linear Interpolation, Quadratic Interpolation, Newton's Divided Difference Interpolation. [15 hrs]</p> <p>Equal spacing: Newton's Forward Difference Formula, Equal spacing: Newton's Backward Difference Interpolation, Lagrangian Interpolation, Numerical Integration and Differentiation, System of Linear Equations, Gauss Elimination, System of Linear Equations, LU Factorization, System of Linear Equations, Gauss Seidel Iteration Method, System of Linear Equation, Inverse matrix, Method of Least Squares. [15 hrs]</p> <p><u>Part C- MATLAB</u></p> <p>Introduction to MATLAB and what is the environment of it, Generating matrices and the arithmetic operation on it, MATLAB Basics, MATLAB basic functions and recognizing the editor –M files, 2-D and 3-D drawing in MATLAB, Numerical interpolation in MATLAB, Numerical integration, finding the roots of equations of any order, and curve fitting in MATLAB. [15 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy for delivering this module is to encourage students' participation in exercises while refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and simple experiments involving sampling activities that are interesting to students. As well as using programs like MATLAB to experimentally apply the theoretical concepts that the student studies throughout the course.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	75	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	25	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> 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	20% (20)	3, 10	LO # 1, 2 and 3
	<b>Assignments</b>	2	3% (3)	2, 12	LO # 3, 4 and 7
	<b>Projects / Lab.</b>	1	15% (15)	Continuous	All
	<b>Report</b>	1	2% (2)	13	LO # 5, 6 and 7
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>		100% (100 Marks)			

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Numerical Methods in General, Introduction.
Week 2	Solution of Equations by Iteration, fixed-point iteration method, Newton-Raphson method, and Secant method.
Week 3	Interpolation, Linear Interpolation, Quadratic Interpolation, Newton's Divided Difference Interpolation.
Week 4	Equal spacing: Newton's Forward Difference Formula, Equal spacing: Newton's Backward Difference Interpolation, Lagrangian Interpolation.
Week 5	Numerical Integration and Differentiation.
Week 6	System of Linear Equations, Gauss Elimination.
Week 7	System of Linear Equations, LU Factorization
Week 8	System of Linear Equations, Gauss-Seidel Iteration Method
Week 9	System of Linear Equations, Inverse Matrix
Week 10	Method of Least Squares
Week 11	Introduction to MATLAB
Week 12	Application on MATLAB
Week 13	Application on MATLAB
Week 14	Application on MATLAB
Week 15	Application on MATLAB
Week 16	Preparatory week before the final Exam

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	General introduction about MATLAB
Week 2	Introduction to Computing in Engineering and Science
Week 3	How to use MATLAB (using M- files)
Week 4	Anatomy of a Graph
Week 5	More details about Graph
Week 6	Writing equations in MATLAB
Week 7	Practical applications of MATLAB

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	1. Erwin Kreyszig, "Advanced engineering mathematics" John wiley & sons, sixth edition, 1988 2. C. Ray Wylie, " Advanced engineering mathematics" McGRAW-Hill, INC, Ltd, fourth edition, 1975. 3. Kiusalaas, " Numerical Methods in Engineering with MATLAB", Cambridge University press, 2005.	Yes
<b>Recommended Texts</b>	1. Kiusalaas, " Numerical Methods in Engineering with MATLAB", Cambridge University press, 2005.	no
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جداً	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 (0 - 49)</b>	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Theory of Structures II		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CE309		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII	Semester of Delivery	
Administering Department	Civil Eng. Dep.	College	College of Engineering
Module Leader	Dr. Oday Asal Salih	e-mail	odaycivileng@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Jasim Ali Abdullah	e-mail	jassim24676@uomosul.edu.iq
Peer Reviewer Name	Dr. Suhaib Y Al-darzi	e-mail	<a href="mailto:suhaib.gasim@uomosul.edu.iq">suhaib.gasim@uomosul.edu.iq</a>
Scientific Committee Approval Date	1-9-2025	Version Number	1.0

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

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## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	Using the method of consistent deformations, the method of least work, the slope-deflection method, and the moment distribution method, students will learn how to do an analysis of statically indeterminate beams, trusses, rigid frames, and composite structures. Line of influence for structures whose properties are statically uncertain.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1- Apply basic mathematics, science and engineering principles to solve engineering problems.</li><li>2- Defining the methods used to find stresses in Indeterminate Structures.</li><li>3- Defining the methods to find stresses in Structures that are subjected to moving loads.</li><li>4- Analyze the indeterminate structures (Beams, Frames, and Trusses).</li><li>5- Draw the shear force and moment diagrams (Beams, Frames).</li><li>6- Draw the influence lines of indeterminate structures (Beams).</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>Approximate analysis for statically indeterminate structures [10hrs].</p> <p>Analysis of statically indeterminate beam, trusses , rigid frames , and composite structures by the method of consistent deformations [10 hrs].</p> <p>Analysis of statically indeterminate beam, trusses , rigid frames , and composite structures by the method of least work [10 hrs].</p> <p>Analysis of statically indeterminate beams and rigid frames without joint translation by the slope-deflection method [10 hrs].</p> <p>Analysis of statically indeterminate rigid frames with one,two and several degree of freedom of joint translation by the slope-deflection method [10 hrs].</p> <p>Analysis of statically indeterminate rigid frames without joint translation by moment distribution. Modified Stiffness factors [10 hrs].</p> <p>Analysis of statically indeterminate rigid frames with one degree of freedom of joint translation by moment distribution. Influence line for statically indeterminate structure, Maxwell's law, Betti's law [15 hrs].</p>
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	The primary approach that will be used to present this module is to promote student engagement in the activities while also enhancing and broadening their critical thinking abilities. Classes, interactive tutorials, and straightforward experiments with a few fun sampling exercises will be used to do this.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Approximate analysis for statically indeterminate structures
<b>Week 2</b>	Analysis of statically indeterminate beam, trusses , rigid frames , and composite structures by the method of consistent deformations
<b>Week 3</b>	Analysis of statically indeterminate beam, trusses , rigid frames , and composite structures by the method of consistent deformations
<b>Week 4</b>	Analysis of statically indeterminate beam, trusses , rigid frames , and composite structures by the method of least work
<b>Week 5</b>	Analysis of statically indeterminate beam, trusses , rigid frames , and composite structures by the method of least work
<b>Week 6</b>	Analysis of statically indeterminate beams and rigid frames without joint translation by the slope-deflection method
<b>Week 7</b>	Analysis of statically indeterminate beams and rigid frames without joint translation by the slope-deflection method
<b>Week 8</b>	Analysis of statically indeterminate rigid frames with one,two and several degree of freedom of joint translation by the slope-deflection method Analysis of statically indeterminate rigid frames with one,two and several degree of freedom of joint translation by the slope-deflection method

<b>Week 9</b>	Analysis of statically indeterminate rigid frames without joint translation by moment distribution
<b>Week 10</b>	Analysis of statically indeterminate rigid frames without joint translation by moment distribution
<b>Week 11</b>	Analysis of statically indeterminate rigid frames without joint translation by moment distribution (Modified Stiffness factors)
<b>Week 12</b>	Analysis of statically indeterminate rigid frames with one degree of freedom of joint translation by moment distribution
<b>Week 14</b>	Analysis of statically indeterminate rigid frames with one degree of freedom of joint translation by moment distribution
<b>Week 15</b>	Influence line for statically indeterminate structure, Maxwell's law, Betti's law
<b>Week 16</b>	Final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Structural Analysis, Russell C. Hibbeler, Pearson Education Limited, 10 <sup>th</sup> edition, 2020.	No
<b>Recommended Texts</b>	Structural Analysis, Aslam Kassimali Cengage Learning, 6 <sup>th</sup> edition, 2019.	No
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

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

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Soil Mechanics II	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE310		
ECTS Credits	6.00		
SWL (hr/sem)	150		
Module Level	UGIII	Semester of Delivery	Six
Administering Department	Civil Eng. Dep.	College	College of Engineering
Module Leader	Dr. Mohammed N. Jaro	e-mail	E-mail: m.jaro@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Mohammed N. Jaro Lecturer	e-mail	E-mail: m.jaro@uomosul.edu.iq
Peer Reviewer Name	امينة احمد خليل	e-mail	amina.alshumam@uomosul.edu.iq
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	

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## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>The course aims to give students the knowledge to understand the theory of shear strength of the soil and methods of measuring its coefficients, which are the angle of internal friction and the cohesion. It is an important introduction to the bearing capacity calculations for different soils, through which the ability of the soil to bear the structures built on it. The issue of engineering soil problems and how to improve the soil to raise its bearing capacity, reduce subsidence, and avoid the problems of swelling and fallout, and the effects of gypsum and saline soils will also be discussed. Finally, the issue of lateral pressures of the soil and its calculations is explained, which paves the way for the design of the supporting facilities. The improvement of soil through compaction process in field and laboratory..</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Understand the shear strength behavior of the soil and find the shear parameters which are important in the calculation of the bearing capacity of the soil.</li> <li>2. Classify the soil according to shear strength that cohesive and cohesionless soils and characteristics of each one.</li> <li>3. Calculate the lateral earth pressure and the lateral force that applied on the retaining walls which is essential for design the retaining walls and for factor of safety against failure.</li> <li>4. Learn how to control the compaction in the field as well as the methods of compaction in field and laboratory.</li> <li>5. Distinguish the problematic soils which caused a severe problem to the structures.</li> <li>6. Estimate the factor of safety against sliding or failure of slope of natural and artificial slopes.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<ul style="list-style-type: none"> <li>- Shear strength theory, parameters of the shear strength, failure mechanism, plane of failure, stresses on the planes in soil, Mohr's circle and Mohr's envelope of failure, laboratory and field shear strength tests.[17]</li> <li>- Lateral earth pressure; calculate the lateral earth pressure in active, at rest and passive cases. Rankin's and Coulomb's theories of lateral earth pressure. [15]</li> <li>- Problematic soils such as collapsible soil, swelling soil, gypseous soil, etc.[15]</li> <li>- Mechanical stabilized soil by compaction process. Factors affecting compaction characteristics, compaction curve, optimum moisture content and maximum dry density, and compaction test in field and laboratory. [15]</li> <li>- Slope stability, Factor of safety, finite and infinite slopes. [16]</li> </ul>

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<p><b>Strategies</b></p>	<p>One of the most important strategies is to increase students' skills in applying theoretical materials in the field of civil engineering. As well as developing their capabilities in solving engineering problems that they may encounter in field work. This is done by training them to prepare reports and solve practical issues, in addition to acquiring knowledge about the types of soils through conducting laboratory and field experiments.</p>
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## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b>	78	<b>Structured SWL (h/w)</b>	5.5
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الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Introduction and definition of shear strength in soil
<b>Week 2</b>	General and principle stresses in soil; Mohr-Coulomb theory of the shear strength;
<b>Week 3</b>	Shear strength of cohesive soil and cohesionless soils; Shear strength parameters;
<b>Week 4</b>	Application Examples
<b>Week 5</b>	Introduction to lateral earth pressure; Types of lateral earth pressure (At rest, active and passive); Coefficients of lateral earth pressure
<b>Week 6</b>	Rankin's theory of active and passive lateral earth pressure
<b>Week 7</b>	Coulomb theory of lateral earth pressure; Application examples;
<b>Week 8</b>	Problematic soils; Definition; Soil problem description;
<b>Week 9</b>	Soil types such as collapsible soil, swelling soil, gypseous soil, etc.
<b>Week 10</b>	Soil stabilization; Mechanical stabilization; Compaction process; Compaction theory
<b>Week 11</b>	Control of compaction in field; Field and laboratory compaction tests;
<b>Week 12</b>	Compaction curve characteristics; Application examples
<b>Week 13</b>	Introduction to slope stability; type of slope infinite and finite slopes
<b>Week 14</b>	Calculate the factor of safety; Slices method
<b>Week 15</b>	Calculate the factor of safety; Slices method
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Introduction to laboratory
<b>Week 2</b>	Lab 2: Laboratory shear test equipment description test- explain
<b>Week 3</b>	Lab 3: Laboratory shear test - training

<b>Week 4</b>	Lab 4: Unconfined compression test- explain
<b>Week 5</b>	Lab 5: Unconfined compression test - training
<b>Week 6</b>	Lab 6: Direct shear test- explain
<b>Week 7</b>	Lab 7: Direct shear test- training
<b>Week 8</b>	Lab 8: Triaxial shear test- explain
<b>Week 9</b>	Lab 9: Compaction tests in laboratory-Standard
<b>Week 10</b>	Lab 10: Compaction tests in laboratory-Standard
<b>Week 11</b>	Lab 11: Compaction tests in laboratory-Modified
<b>Week 12</b>	Lab 12: Compaction tests in laboratory-Modified
<b>Week 13</b>	Lab 13: Comprehensive review

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	1. "Principles of Geotechnical Engineering", (2004), Braja M. Das, 5th edition 2002, copyright by Wadsworth Group/United States. 2. "Principal of Soil Mechanic", (1991), Mohammed O. AL-Asho, (Book language in Arabic).	Yes
<b>Recommended Texts</b>	1. "Elements of Soil Mechanics", (1988), G. N. Smith and Ion G. N. Smith, USA. 2. "Problem Solving in Soil Mechanics", (2003), A. Aysen, Swets & Zeitlinger B.V	No
<b>Websites</b>	No	

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


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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Reinforced Concrete II	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE311		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII		
Administering Department	Civil Eng. Dep.	College	College of Engineering
Module Leader	Dr. Rabi. M. Najem	e-mail	<a href="mailto:dr.rabi.najem@uomosul.edu.iq">dr.rabi.najem@uomosul.edu.iq</a>
Module Leader's Acad. Title	Assist. Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Halla Jasem Mohamed	e-mail	<a href="mailto:engrehal.1984@uomosul.edu.iq">engrehal.1984@uomosul.edu.iq</a>
Peer Reviewer Name	Dr. Suhaib Y Al-darzi	e-mail	<a href="mailto:suhaib.qasim@uomosul.edu.iq">suhaib.qasim@uomosul.edu.iq</a>
Scientific Committee Approval Date	1-9-2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Reinforced Concrete I	Semester	5
Co-requisites module	None	Semester	

  
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## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>Teaching the students how to make a safe and economical design for different structural members (beams, short columns and slender columns, with calculating the development length and lap splice of steel bars under tension and compression), through the restriction of the used designed code ( ACI code 2008 ), and providing them with experience to handle different designing and construction problems in site.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>Students who successfully complete this course will be able to:</p> <ol style="list-style-type: none"><li>1. Analysis of short columns under compression.</li><li>2. Analysis of short columns under tension.</li><li>3. Design of Axially loaded Short columns.</li><li>4. Design of Uniaxially loaded.</li><li>5. Analysis and design of biaxially loaded columns</li><li>6. Designing of slender columns ( sway and non sway ).</li><li>7. Calculate the development length of steel bars in compression and tension.</li><li>8. Calculate the cutoff bar distance for reinforcing steel.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part I ( 35 hrs.)</u></p> <ul style="list-style-type: none"><li>- Introduction to short columns, Types of columns (Axially loaded, Uniaxially loaded, and Biaxially loaded), ACI Code Limitations for short columns.</li><li>- The Interaction diagram for uniaxially loaded column.</li><li>- Solved example of drawing the interaction diagram.</li><li>- Solved example of axially loaded column.</li><li>- Solved examples of uniaxially loaded columns under compression.</li><li>- Solved examples of uniaxially loaded columns under tension.</li><li>- Design theory of biaxially loaded columns.</li><li>- Solved examples of biaxially loaded columns.</li></ul> <p><u>Part II ( 20 hrs. )</u></p> <ul style="list-style-type: none"><li>- Introduction to long columns.</li><li>- Failure types of columns.</li><li>- ACI Code limitation for designing long columns (Non sway).</li><li>- ACI Code limitation for designing long columns (Sway).</li></ul>

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	<ul style="list-style-type: none"> <li>- Solved example of long columns design (Non sway).</li> <li>- Solved example of long columns design (Sway).</li> </ul> <p><u>Part III ( 20 hrs. )</u></p> <ul style="list-style-type: none"> <li>- Defining the development length of steel bars.</li> <li>- Lap splice of reinforcing steel in tension.</li> <li>- Lap splice of reinforcing steel in compression.</li> <li>- Cutoff steel bars.</li> <li>- Solved examples.</li> </ul>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	20% (20)	4, 13	LO #3, 4, 5, and 6
	<b>Assignments</b>	3	20% (20)	4, 13	LO #3, 4, 5, and 6
	<b>Projects / Lab.</b>				
	<b>Report</b>				

<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	3 hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Analysis and design of short columns (Introduction to short columns)
<b>Week 2</b>	Analysis and design of short columns (The interaction diagram of uniaxially loaded columns)
<b>Week 3</b>	Analysis of short columns (Analysis of columns–compression failure)
<b>Week 4</b>	Analysis of short columns (Analysis of columns–tension failure)
<b>Week 5</b>	Design of short columns (Design of columns–compression failure)
<b>Week 6</b>	Design of short columns (Design of columns–tension failure)
<b>Week 7</b>	Analysis and design of short columns (Design of biaxially loaded columns)
<b>Week 8</b>	Analysis and design of short columns (Design of biaxially loaded columns)
<b>Week 9</b>	Midterm Exam
<b>Week 10</b>	Analysis and design of long columns (Introduction to long columns with code limitations)
<b>Week 11</b>	Analysis and design of long columns (Design of long columns – non sway)
<b>Week 12</b>	Analysis and design of long columns (Design of long columns – sway)
<b>Week 13</b>	Development and lap splices. (ACI Code limitations for development length)
<b>Week 14</b>	Development and lap splices. (lap splice for tension members)
<b>Week 15</b>	Development and lap splices. (lap splice for compression members)
<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>	

Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Basics of Reinforced concrete. Saad Al Taan, 1991	Yes
Recommended Texts	Building Code Requirements for Structural Concrete (ACI 318M-19) and Commentary.	Yes
Websites		

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

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Highway engineering II	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE312		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII		
Administering Department	CE	College	COE
Module Leader	Dr. Mohamed Ahmed	e-mail	mohammad66ah@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Yazin Abdulilah Alnajjar	e-mail	yazinalnajjar@uomosul.edu.iq
Peer Reviewer Name	ا.د. عبد الرحيم ابراهيم جاسم	e-mail	alhadidy@uomosul.edu.iq
Scientific Committee Approval Date	1-9-2025	Version Number	1.0

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

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## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>Module aims is to provide students the necessary background information for asphalt and aggregate used for the construction of the highways their engineering properties, as well as teaching them the engineering behavior of flexible and rigid pavements. Methods for determining the thickness for flexible and rigid pavements layers were also included.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Understanding the properties of asphalt and aggregate used in highway construction, their tests and specifications.</li> <li>2. Classifying the asphalt according to the uses.</li> <li>3. Determining the thicknesses of highway layers for both flexible and rigid pavements.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A - Soil Engineering for Highway Design</u> Soil Characteristics. Basic Engineering Properties of Soils. Classification of Soils for Highway Use. Soil Surveys for Highway Construction. Soil Compaction. Special Soil Tests for Pavement Design [6 hrs]</p> <p><u>Part B - Bituminous Materials</u> Sources of Asphalt. Description and Uses of Bituminous Binders. Properties of Asphalt Materials. Tests for Asphalt Materials. Asphalt Mixtures. Superpave Systems [10 hrs]</p> <p><u>Part C – Design of Flexible Highway Pavements</u> Structural Components of a Flexible Pavement. Soil Stabilization. General Principles of Flexible Pavement Design. Asphalt Institute Flexible Pavement Design. AASHTO Flexible Pavement Design. [6 hrs]</p> <p><u>Part D – Design of Rigid Pavements</u> Materials Used in Rigid Pavements. Joints in Concrete Pavements. Types of Rigid Highway Pavements. Pumping of Rigid Pavements. Stresses in Rigid Pavements Portland Cement Association Design Method. AASHTO Rigid Pavement Design Method. [8 hrs]</p>

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<p><b>Strategies</b></p>	
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	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.
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

<b>Module Evaluation</b> 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	All
	<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> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Basic Engineering Properties of Soils for highway design

<b>Week 2</b>	Classification of soils for highway use
<b>Week 3</b>	Special Soil Tests for Pavement Design
<b>Week 4</b>	Description and uses of asphalt
<b>Week 5</b>	Properties of asphalt materials
<b>Week 6</b>	Tests for asphalt materials
<b>Week 7</b>	Superpave Systems
<b>Week 8</b>	Production, Laying and compaction of asphalt mixtures
<b>Week 9</b>	Structural components of flexible pavement
<b>Week 10</b>	Asphalt Institute design method
<b>Week 11</b>	AASHTO Flexible Pavement Design
<b>Week 12</b>	Materials Used and Stresses in Rigid Pavements
<b>Week 13</b>	Joints in Concrete Pavements, and types of Rigid Highway Pavements
<b>Week 14</b>	Portland Cement Association Design Method
<b>Week 15</b>	AASHTO Rigid Pavement Design Method
<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>	Lab 1: Aggregate Gradation and percentage Determination
<b>Week 2</b>	Lab 2: Optimum Asphalt Content Determination
<b>Week 3</b>	Lab 3: Extraction test-1
<b>Week 4</b>	Lab 4: Extraction test-2
<b>Week 5</b>	Lab 5: CBR Test-1
<b>Week 6</b>	Lab 6: CBR Test-2
<b>Week 7</b>	Lab 7: Los Anglos test

### Learning and Teaching Resources

مصادر التعلم والتدريس

	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Traffic and Highway Engineering, Enhanced Fifth Edition, SI Edition, Nicholas J. Garber, Lester A. Hoel, Cengage Learning, Inc., 2020.	Yes

<b>Recommended Texts</b>	Pavement Analysis and Design, Second Edition, Yang H. Huang, Pearson Education, Inc., 2004.	No
<b>Websites</b>	<a href="https://www.pavement engineering">https://www.pavement engineering</a>	

<b>Grading Scheme</b> مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (50 - 100)	<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</b> (0 - 49)	<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
<p><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.</p>				

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Hydraulic structures	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE313		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGIII		
Administering Department	Civil Engineering Dep.	College	College of Engineering
Module Leader	Dr. Ayman Talib Hameed	e-mail	ayman.th@uomosul.edu.iq
Module Leader's Acad. Title	Assistant professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	امينة احمد خليل	e-mail	amina.alshumam@uomosul.edu.iq
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	

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## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. To form engineering thinking for students, capabilities to use innovative technical and technological solutions in hydraulic engineering.</li> <li>2. To increase the ability of students to identify, formulate and solve problems in a systematic way.</li> <li>3. To provide students the basic information about the types of hydraulic structures and the design considerations and procedures regarding the form and function of many types of hydraulic structure.</li> <li>4. Introduce the students the basic design criteria applicable for hydraulic structures such as energy dissipators , cross drainage work, spillways, , and dams.</li> <li>5. Students will understand interaction between hydraulic structures and surrounding conditions.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Students will learn the fundamental of hydraulic structures and their applications.</li> <li>2. Students will demonstrate the ability to determine the classification of Hydraulic structures according to use, function and materials.</li> <li>3. Be able to define hydraulic structures, their purpose, international and national problems in the field of hydraulic engineering.</li> <li>4. Students learn the analysis process to be involved in designing various structural components used in professional structural engineering.</li> <li>5. To know the elements of hydraulic structures, to be able properly select the parameters of their elements and to apply calculation methods.</li> <li>6. Students will demonstrate the ability to check the safety of the hydraulic structures problems in surface and subsurface flow such as the safety against piping.</li> <li>7. Design a system or structure to meet the specific needs resulting from the analyses and interpretation of data.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Introduction of hydraulic structures, Hydraulic jump and its applications. Draw the water surface profile of hydraulic jump, Types of energy dissipaters. Types and design of stilling basins. [9 hrs]</p> <p>Theories of concrete floor-design, Bligh theory and lanes theory, Design of concrete floor-using Bligh theory and lanes theory. Design of concrete floor-using Khoslas theory. Hydraulic analysis and design of culverts. [14 hrs]</p> <p>Spillways, Design of Ogee spillway, Types and design of cross drainage works, Design of syphon, Canal regulation works, Types of regulators, Design of regulators. [15 hrs]</p> <p>Protection works, Design of scour, Dams, Design of concrete gravity dam. [11 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The learning and teaching strategy is designed to provide students with a basic theoretical and practical understanding of the hydraulic structures within the open channel flows. The learning and teaching methods include question and answer in class allowing students time to reflect on and apply the lecture material and develop problem solving skills.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	75		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	20% (20)	4, 10	LO #1-2, and 5
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 3, and 4
	<b>Projects / Lab. Report</b>	1	10% (10)	13	LO # 6 and 7
	<b>Summative assessment</b>				
	<b>Midterm Exam</b>	2 hr	10% (10)	9	LO # 1-6
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	<b>Material Covered</b>
<b>Week 1</b>	Introduction of hydraulic structures, Hydraulic jump and its advantages in the design of hydraulic structures.
<b>Week 2</b>	Draw the water surface profile of hydraulic jump, Types of energy dissipaters.
<b>Week 3</b>	Types and design of stilling basins.
<b>Week 4</b>	Theories of concrete floor-design, Bligh theory and lanes theory, Design of concrete floor-using Bligh theory and lanes theory.
<b>Week 5</b>	Design of concrete floor-using Khoslas theory.
<b>Week 6</b>	Hydraulic analysis and design of culverts.
<b>Week 7</b>	Spillways.
<b>Week 8</b>	Design of Ogee spillway.
<b>Week 9</b>	Types and design of cross drainage works.
<b>Week 10</b>	Design of syphon.
<b>Week 11</b>	Canal regulation works, Types of regulators.
<b>Week 12</b>	Design of regulators.
<b>Week 13</b>	Protection works, Design of scour.
<b>Week 14</b>	Dams
<b>Week 15</b>	Design of concrete gravity dam.
<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>	
<b>Week 2</b>	
<b>Week 3</b>	
<b>Week 4</b>	
<b>Week 5</b>	
<b>Week 6</b>	
<b>Week 7</b>	

### Learning and Teaching Resources

مصادر التعلم والتدريس

	<b>Text</b>	<b>Available in the</b>

		Library?
<b>Required Texts</b>	Theory and design of irrigation structures (volume 2), R.S.Varshneny, Fourth Edition, N.C.Jain, 1979.	Yes
<b>Recommended Texts</b>	Irrigation, Water Power and Water Recourses Engineering, Dr. K. R. Arora, 4 th Reprint Edition 2006. Irrigation, Water Power and Water Recourses Engineering, Dr. K. R. Arora ,4 th Reprint Edition 2006. Engineering and Hydraulic Structures, Santosh Kumear Gary, 14th Reviere edition in S.I. Units.	No
<b>Websites</b>		

<b>Grading Scheme</b> مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (50 - 100)	<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</b> (0 – 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required
<b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Project Design and Planning	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CE314		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UGIII		
Administering Department	Civil Eng. Dep.	College	College of Engineering
Module Leader	Dr. Khawla Ahmed	e-mail	Khawlah.ahmad@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	امينة احمد خليل	e-mail	amina.alshumam@uomosul.edu.iq
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	

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## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>Providing the technical possibility for students to use the various engineering programs. Helping students analyze and design multi-story buildings and footings as well as retaining structures. So, reducing the effort involved in analyzing and designing them manually by adopting all theoretical concepts that were taken in the previous stages and applied in this course.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. The student recognizes the advantages of the program and the importance of using it for the analysis and design of structures.</li> <li>2. Comparison of program results with manual solutions and with specifications and accuracy of results.</li> <li>3. Applying the instructions of the program in the analysis and design of multi-story buildings in the engineering project course.</li> <li>4. Check analysis and design results and compare them with specifications and evaluate the economic aspect of the design.</li> <li>5. Analyze various problems regarding to foundations, retaining structures, earth embankment etc</li> <li>6. Analyze a number of dynamic problems such as structures subjected to earthquake, foundation machine, vibration creating during pile driving, etc</li> <li>7. Verifying the results obtained from software programs by comparing with those obtained manually.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><b><u>Part A – STAAD Pro V8i.</u></b></p> <p>An introduction to the STAAD Pro V8i software Explanation of playlists [3 hrs]          Explain how to represent and analyze the beams in the program and read the results[3 hrs]          Representation and analysis of planar (2D) structures and review of results [3 hrs]          Representation and analysis of a multi-story structural building (3D) [2 hrs]          Representation and analysis of a multi-story structural building (3D) with slabs and view results [3 hrs]          Concrete design for reinforced concrete structural members (beams, columns and slabs) from the design list [3 hrs]          Concrete design for reinforced concrete structural members (beams, columns and slabs) by using interactive method [3 hrs]          Preparing a report with the results and exporting it to the word program [2 hrs]</p> <p><b><u>Part B – PLAXIS V8.2</u></b></p> <p><b>Introduction to Plaxis 2D software [3 hrs]</b>  <b>Explain how to represent and analyze various geotechnical problems [3 hrs]</b>  <b>Representation and analysis of Settlement of a circular flexible footing on sand[3 hrs]</b>  <b>Representation and analysis of Settlement of a circular rigid footing on sand [3 hrs]</b>  <b>Representation and analysis of Construction of road embankment [3 hrs]</b>  <b>Representation and analysis of Building subjected to an earthquake [3 hrs]</b></p>

	Representation and analysis of Pile driving [3 hrs] Preparing a report with the results and exporting it to the word program [2 hrs]
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	48	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	3
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	75		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	4	20% (20)		LO #1, 2, 3 and 4
	<b>Assignments</b>	2	10% (10)		LO # 3 and 4
	<b>Projects / Lab.</b>	2	10% (10)	Continuous	All
	<b>Report</b>				
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	
Week 2	
Week 3	
Week 16	Preparatory week before the final Exam

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to STAAD Pro V8i Explanation of playlists
Week 2	Explain how to represent and analyze the beams in the program and read the results
Week 3	Representation and analysis of planar (2D) structures and review of results
Week 4	Representation and analysis of a multi-story structural building (3D).
Week 5	Representation and analysis of a multi-story structural building (3D) with slabs and view results
Week 6	Concrete design for reinforced concrete structural members (beams, columns and slabs) from the design list
Week 7	Concrete design for reinforced concrete structural members (beams, columns and slabs) by using interactive method
Week 8	Preparing a report with the results and exporting it to the word program
Week 9	Introduction to Plaxis 2D software
Week 10	Explain how to represent and analyze various geotechnical problems
Week 11	Lesson 1: Settlement of a circular flexible footing on sand
Week 12	Lesson 2: Settlement of a circular rigid footing on sand
Week13	Lesson 3: Construction of road embankment
Week14	Lesson 4: Building subjected to an earthquake
Week15	Lesson 5: Pile driving & Preparing a report with the results and exporting it to the word program
Week16	Preparatory week before the final Exam

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	PLAXIS 2D Manual	
<b>Recommended Texts</b>	PLAXIS 3D Manual	
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (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 (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.

## Course Description Form

University of Mosul

College of Engineering

Department: Civil Engineering

<b>1. Course Name:</b>					
Reinforced Concrete Design_I					
<b>2. Course Code:</b>					
CE401					
<b>3. Semester / Year:</b>					
2025-2026					
<b>4. Description Preparation Date:</b>					
1-9-2025					
<b>5. Available Attendance Forms</b>					
Attending Lecture					
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>					
60/3					
<b>7. Course administrator's name (mention all, if more than one name)</b>					
- Dr. Suhaib Y. Kasim Al-Darzi. (Professor)					
- Dr. Muna M. Hano (Assistant Professor)					
<b>8. Course Objectives</b>					
Course Objectives	<p>The students will be familiar with the fundamentals for reinforced concrete design floors, beams considering the international codes in design as ACI codes to make the student able to understand and start working in the design field. On completion of the course the student will be able to:</p> <ul style="list-style-type: none"> <li>Design of one-way RC slabs and continuous beams,</li> <li>Design of two-way RC slabs supported on edge beams,</li> <li>Design of one-way ribbed slabs and voided slabs, and</li> <li>Design of flat slabs.</li> <li>Design of Stairs</li> <li>Yield line theory for slab</li> </ul>				
<b>9. Teaching and Learning Strategies</b>					
Strategy	Lectures, Videos, Assignments				
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation method
1	4	2	Introduction: Review the principles of reinforced concrete design, Design of One-way slab and continuous beams		
2	4	2	Design area of steel reinforcement and minimum area for shrinkage and temp. in slab and flexure for beams. Approximate bent or cutoff points and maximum spacing for main and secondary reinforcement.		
3	4	2	Beam loads and critical moment and shear sections in beams. Detailing for reinforcement continuous beams and slabs. Detailing for reinforcement continuous beams and slabs. Homework; Tutorial; Quiz		

4	4	2	Two-way edge supported slabs Minimum slab thickness., Direct design method and limitations. Total static moment (panel moment). Middle and edge strip width and moment distribution.		
5	4	2	Check for shear strength and flexure and calculation of steel reinforcement, checking minimum area and max spacing. Design for beam supporting two-way slabs. Design by moment coefficient method. Homework and Quiz		
6	4	2	Flat slabs and flat plates: Minimum thickness of beamless slab according to ACI code. Effective span length and minimum drop panel dimension. The drop panel dimensions and requirements. Check for punching shear strength and diagonal shear. Application of direct design method.		
7	4	2	Design of flexural reinforcement at all critical moment section. Check the minimum and maximum spacing. Design by moment coefficient method. Openings in flat slab construction. Detailing of reinforcing steel considering minimum extension bars lengths. Homework		
8	4	2	One-way ribbed slabs Code limitations and dimension. Diagonal shear, solid part. Voided slabs, equivalent rib width. Design for steel reinforcements in ribs and topping slab. Hollow block floor.		
9	4	2	Mid-term exam		
10	4	2	Design of reinforced concrete stairs Stair types and stair limitations. Design stairs mainly reinforcement in transverse direction. Design stairs longitudinally reinforced. Effective spans, loading and moment calculation.		
11	4	2	The calculations of the positive and negative moments Checking shear in stairs. Reinforcement and structural details of the stair. Quiz		
12	4	2	Yield line theory of slab analysis Yielding slabs and development of plastic hinges. Guide lines to established patterns of yield lines and axis of rotations slabs. Axes of rotations and failure shape. Analysis by equilibrium method.		
13	4	2	Virtual work method. Isotropically and orthotropically reinforced slabs. Components of work methods. Different types of loading. Circular and polygon slab panels.		
14	4	2	Slabs with large opening. Optimization method for load calculation. Circular and prismatic slabs. Slabs with large openings.		
15			Final Exam		

Learning and Teaching Resources:	
Prescribed textbooks (syllabus books, if available)	Arthur H. Nilson, David Darwin, Charles W. Dolan (2011) "Design of concrete structures", McGraw-Hill Education.
☐ Main references (sources)	ACI Committee 318. (2014). Building code requirements for structural concrete: (ACI 318-14); and commentary (ACI 318R-14). Farmington Hills, MI: American Concrete Institute.
☐ Recommended supporting books and references (scientific journals, reports...)	
☐ Main references (sources)	
☐ Main references (sources) update rate	

  
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## Course Description Form

<b>1. Course Name:</b>	
Foundation Engineering - I	
<b>2. Course Code:</b>	
CE402	
<b>3. Semester / Year:</b>	
2025-2026	
<b>4. Description Preparation Date:</b>	
1/9/2025	
<b>5. Available Attendance Forms:</b>	
In-person attendance	
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>	
60/3	
<b>7. Course administrator's name (mention all, if more than one name)</b>	
Dr. Abdulrahman H. Al-Daood Dr. Qutayba N. Al-Saffar                      Email: <a href="mailto:dr.qutayba@uomosul.edu.iq">dr.qutayba@uomosul.edu.iq</a>	
<b>8. Course Objectives</b>	
<b>Course Objectives</b>	Introduce students to the most important field investigations for various civil engineering projects Provide students with sufficient information on studying the bearing capacity of soil under foundations. Provide students with sufficient information to calculate and estimate settlement in various structures. Introduce students to the design of various types of foundations.
<b>9. Teaching and Learning Strategies</b>	
<b>Strategy</b>	Sustainable Education Strategy. Strategy for linking theoretical aspects with practical application.

## 10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction and General Information (Definition of foundation engineering and types of foundations)	Fundamentals of Foundation Engineering	A logical explanation of the subject being taught. Informational sustainability through recalling previous topics and linking them to the new topic. Attempting to link the theoretical aspect with the practical aspect.	Daily exams (4). Monthly exams (2). Final exam.
2+3	6	Introduction to field investigations			
4+5	6	Calculating soil bearing capacity for different types of foundations			
6	3	bearing capacity of clay soil			
7	3	bearing capacity of sandy soil			
8	3	Calculate the settlement under the foundations			
9	3	Introduction to foundation designs			
10	3	Structural design of single column foundations			
11	3	Design of reinforced and unreinforced wall foundations			
12	3	Rectangular continuous foundation design			
13+ 14+15	9	Mat foundation design with applications			

### 11. Course Evaluation and Grade Breakdown:

Daily exams (12) + monthly exams (20) + attendance, participation and assignments (8) = annual effort (40%)

### Learning and Teaching Resources:

"Principles of Foundation Engineering" , 9th\_Edition, \_SI\_Edition By Braja-M. Dass . (2018).  
Foundation Design & Analysis By Josph E. Bowels (1996)

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## Course Description Form

<b>1. Course Name:</b>	
Steel design I	
<b>2. Course Code:</b>	
CE403	
<b>3. Semester / Year:</b>	
Fall/ 2025-2026	
<b>4. Description Preparation Date:</b>	
1-9-2025	
<b>5. Available Attendance Forms</b>	
Attendance	
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>	
45/2	
<b>7. Course administrator's name (mention all, if more than one name)</b>	
Assistant Professor Dr. Baraa J. Mahmood Assistant Professor Dr. Kaythar A. Ibrahim	
<b>8. Course Objectives</b>	
Course Objectives	<p>Introduce students to the fundamental design process of steel as a structural member, which is found in bridges and building structures.</p> <p>The AISC LRFD Code is the design specifications choice used in this course.</p> <p>Understanding the relationship between analysis and design of steel structures by applying knowledge from statics, mechanics of solids, and structural analysis further.</p> <p>In this course, the students learn how to analyze the steel members under different loading conditions. In addition to the connection between members.</p>
<b>9. Teaching and Learning Strategies</b>	
Strategy	<p>The main strategy for delivering this module will be to encourage students' participation in the exercises while refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and simple, student-interesting sampling experiments.</p>
<b>10. Course structures</b>	

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation method
1	3	<p>At the end of this course, students will have gained knowledge of the fundamental concepts behind the design of structural steel, as well as instruction in the most recent design and analysis methods for steel structural elements. Understand the design criteria, LRFD design philosophy, and behavior of structural steel according to ANSI/AISC 360-16 - An American National Standard (Specification for Structural Steel Buildings). Learning how to use the AISC Manual (American Institute of Steel Construction Manual). Calculate the acceptable design loading for steel members. Able to analyze and design tension members and compression members. Able to analyze and design simple connections between structural elements.</p>	Introduction to structural steel design, including material properties, steel sections, and stress-strain behavior, with application of ANSI/AISC 360-16 and the AISC Manual (AISC Manual). Covers design methods (LRFD and ASD) and load combinations.	Lectures, problem-solving sessions, and design assignments	Assignments, quizzes, and exams
2	3		Steel sections and fabrication methods (rolled, built-up sections)		
3	3		Design philosophies: LRFD vs ASD, load combinations, Design basis, and limit states in steel structures		
4	3		Limit States and Failure Modes in Steel Members: Gross section yielding, Net section fracture, Buckling and instability, and Block shear failure		
5	3		Behavior of Tension Members: Load transfer in tension members, Stress distribution in gross and net sections, Effect of holes, staggered holes, and connections, Shear lag phenomenon, and Efficiency of tension members.		
6	3		Block Shear Failure and Combined Checks: Block shear failure Mechanism, Identification of block shear paths, AISC equations and applications, controlling limit state selection.		
7	3		Design of Tension Members: Section selection, check the selected section, and comparison with the applied load.		
8	3		Built-up tension members.		
9	3		Introduction to Compression Members, Behavior of axially loaded compression members, Stability and buckling concepts.		
10	3		Elastic Buckling of Columns, Euler buckling theory, slenderness ratio, Effective length, and boundary conditions.		
11	3		Inelastic Buckling Behavior, Inelastic buckling, and column strength curves.		
12	3		Design compressive strength of compression members.		
13	3		Effective length of columns in frames and alignment charts. Stiffness-reduction factors. Design of compression members.		
14	3		Analysis of built-up compression members.		
15	3		Connection requirements for built-up compression members are composed of rolled shapes. Base plate for concentrically loaded columns.		

## 11. Learning and Teaching Resources

Prescribed textbooks (syllabus books, if available)	
Main references (sources)	
Recommended supporting books and references (scientific journals, reports...)	<ul style="list-style-type: none"><li>▪ Structural Steel Design, Jack C. McCormac and Stephen F. Csernak, Pearson Education Limited, 6<sup>th</sup> edition, 2018.</li><li>▪ AISC Construction Manual, 15<sup>th</sup> Edition. 2017</li></ul>
Electronic references, websites	<ul style="list-style-type: none"><li>▪</li></ul>
Curriculum or course description update rate	5%

  
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## Course Description Form

University : Mosul

College : Engineering

Department : Civil

1. Course name and academic level	
Traffic Engineering I / Fourth Year	
2. Course code	
CE 404	
3. Semester/Year	
First / 2025- 2026	
4. Date this description was prepared	
1 / 9/ 2025	
5. Available forms of attendance	
Attendance in the classroom according to the weekly lesson schedule	
6. Number of study hours (total) / Number of units (total)	
2 hours of theory per week( 30 hours total ) / 2 units	
7. Name of the course supervisor and academic title	
Dr. Mohammed Yasseen Taha / Assistant Professor Email: <a href="mailto:mohammedtaha@uomosul.edu.iq">mohammedtaha@uomosul.edu.iq</a>	
8. Scientific course objectives	
Subject objectives	<ul style="list-style-type: none"><li>▪ Understand the general principles of traffic engineering and the characteristics of traffic engineering</li><li>▪ Identify the role of traffic engineering within transportation engineering in life</li><li>▪ Understand the introduction of traffic flow theory.</li><li>▪ Analyzing traffic volume data and finding all its variables .</li><li>▪ Describing the analysis of traffic speed data.</li><li>▪ Study and classify the travel time.</li><li>▪ Analyze and evaluate the delay on different highway classes.</li><li>▪ Identify and analyze the traffic headway and spacing.</li></ul>
9. Teaching and learning strategies	
The student acquires knowledge of the characteristics of traffic engineering and the ability to distinguish, define, analyze and address the most important engineering and mathematical problems and issues in the field of traffic engineering and for specific types of roads distributed on the urban and rural road network and the method of finding the necessary immediate and future solutions and developing the appropriate design and planning for each of them.	
10. Course Structure	

Week	Hours	Required learning outcomes		Learning method	Evaluation method
1	2	Learn about the methods of evaluating and analyzing the traffic characteristic through the studies of traffic volume, speed, travel time and delay.	Introduction, fundamental and definition of transportation eng.	Students' attendance in the classroom and through the educational tools available inside the classroom, with some site visits.	According to the tasks assigned to the student, such as daily preparation, daily, oral, monthly and written exams, and reports.
2	2		Introduction to Traffic Engineering, importance and impact.		
3	2		Traffic engineering and highway functional classification		
4	2		Road users characteristics.		
5	2		Vehicle: static characteristics and operational characteristics		
6	2		Linear and non- linear analysis of vehicles acceleration.		
7	2		Road characteristics and traffic flow models.		
8	2		Traffic speed studies (concept, definition and calculation)		
9	2		Traffic volume variations.		
10	2		Traffic volume counts and estimation,		
11	2		Traffic volume-speed-density (concept, definition and calculation)		
12	2		Travel time and delay studies: definitions, applications & methods		
13	2		Travel time and delay studies: analysis and calculations.		
14	2		Introduction in traffic safety.		
15	2		Accident studies: definitions, applications and classification		

### 11. Course Evaluation and Grade Divisions

Daily attendance and preparation = 10 marks    Daily homework and exam = 10 marks  
 Reports = 5 marks                      Monthly exams = 15 marks                      Final exam = 60 marks

### 12. Learning and teaching references

Required textbooks (methodology if any)	1. Nicholas J. Garber, and Lester A. Hoel," <i>Traffic and Highway Engineering</i> ", Fourth Edition, Cengage Learning, Toronto, Canada, pp. 99-150, 2009. 2. CA O'Flaherty, and et al," <i>Transport Planning and Traffic Engineering</i> ", First Edition, 1997, Published by CRC Press, p. 544, Reprinted 2018.
Main References (Sources)	Institute of Transportation Engineers , H. Douglas Robertson, Joseph E. Hummer, and Donna C. Nelson," <i>Manual of Transportation Engineering Studies</i> ", Prentice Hall Englewood Cliffs, NJ , 1999.
Recommended supporting books and references (scientific journals, reports...)	Not specified only within the field of traffic engineering and according to the titles
Electronic references, Internet sites	Not specified only within the field of traffic engineering and according to the titles
Curriculum update rate or description	10 %

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## Course Description Form

<b>1. Course Name:</b>	
<b>Sanitary Engineering I</b>	
<b>2. Course Code:</b>	
<b>CE405</b>	
<b>3. Semester / Year:</b>	
Autumn /2025-2026	
<b>4. Description Preparation Date:</b>	
<b>1-9-2025</b>	
<b>5. Available Attendance Forms</b>	
In-person	
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>	
30/2	
<b>7. Course administrator's name (mention all, if more than one name)</b>	
Yousif hassan najim	
<b>8. Course Objectives</b>	
<b>Course Objectives</b>	<p>By the end of studying this course, the student should be able to:</p> <ul style="list-style-type: none"> <li>• Explain the basic concepts of the components of the water supply system, its main units, and the function of each unit.</li> <li>• Explain the fundamental principles of sewerage and its relationship to public health and environmental protection.</li> <li>• Interpret variations in water use and their effect on determining water demands and the operational design of projects.</li> <li>• Determine fire-fighting requirements and the basis for calculating the required flows within water supply networks.</li> <li>• Describe the components of a water treatment plant and its treatment stages from intake to distribution.</li> <li>• Calculate population projections and use them to estimate future water requirements and design facilities.</li> <li>• Distinguish water quality based on physical, chemical, and biological parameters and compare them with the adopted standards.</li> <li>• Classify the types of impurities in water and explain the effect of each type on treatment efficiency and the quality of produced water.</li> <li>• Explain the most important environmental laws and regulations related to water and wastewater projects and comply with them in design applications.</li> <li>• Explain the function of the intake unit in a water treatment plant and the requirements for selecting its location and designing it.</li> <li>• Apply engineering principles in preparing a design model for a river intake to ensure efficient withdrawal and safe operation.</li> <li>• Explain coagulation and flocculation processes and their role in removing turbidity and suspended matter from water.</li> <li>• Distinguish the types of mixers used in coagulation and flocculation basins and select the appropriate type according to operating and design conditions.</li> <li>• Perform the design calculations for coagulation basins based on the adopted engineering criteria.</li> </ul>

- Perform the design calculations for flocculation basins and evaluate their operational efficiency.
- Integrate theoretical and practical aspects in the design and operation of water treatment units to achieve quality requirements and environmental safety.

### 9. Teaching and Learning Strategies

<b>Strategy</b>	This course consists of several components, including lectures, individual and group assignments, and e-learning platforms. The course will be taught in English, and all mandatory assignments must be submitted by the specified deadlines for students to be eligible to sit for the examinations.
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### 10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Recognize the components of the water supply system.	Introduction to the components of the water supply system	PowerPoint lecture	quiz
2	2	Recognize the components of the sewerage system.	Introduction to sewerage	PowerPoint lecture	Homework & quiz
3	2	Calculate maximum daily and hourly consumption.	Variations in water use	PowerPoint lecture	Homework
4	2	Calculate fire-fighting requirements.	Fire-fighting requirements	PowerPoint lecture	Homework & quiz
5	2	Know and understand the treatment units in water treatment plants.	Water Treatment Plant	PowerPoint lecture	quiz
6	2	Calculate future population.	Population projections	PowerPoint lecture	Homework & quiz
7	2	Recognize water quality, parameters, and standards.	Water quality, parameters, and standards	PowerPoint lecture	quiz
8	2	Recognize the different types of impurities in water, their sizes, and their effects.	Types and classification of impurities in water	PowerPoint lecture	quiz
9	2	Recognize the major environmental organizations and their regulations.	Environmental laws and regulations	PowerPoint lecture	Homework & quiz
10	2	Recognize the intake unit and	Intake unit in the water treatment plant	PowerPoint lecture	quiz

		types of intakes in water treatment plants.			
11	2	Perform river intake design calculations.	A design model for a river intake	PowerPoint lecture	quiz
12	2	Recognize the types of coagulants and flocculants and the factors affecting these processes.	Coagulation and flocculation	PowerPoint lecture	Homework & quiz
13	2	Recognize the types of mixers used and the factors affecting these processes.	Types of mixers used in coagulation and flocculation basins	PowerPoint lecture	quiz
14	2	Perform the design calculations for a coagulation basin.	Design example for coagulation basins	PowerPoint lecture	quiz
15	2	Perform the design calculations for a flocculation basin.	Design example for a flocculation basin	PowerPoint lecture	quiz

**Learning and Teaching Resources:**

Prescribed textbooks (syllabus books, if available)	Water Supply and Sewerage by E.W. Steel & Teren McGhee (1990).
☐ Main references (sources)	Water and Wastewater Engineering, Mackenzie L. Davis, PhD, PE, BCEE (2010). Design of Water Supply Pipe Networks, John Wiley & Sons (2008).
☐ <b>Main references (sources)</b> references (scientific journals, reports...)	
☐ Main references (sources)	
☐ <b>Main references (sources)</b>	5 %

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## Course Description Form

1. Course Name:	
Computer application I	
2. Course Code:	
CE406	
3. Semester / Year:	
1st Semester/2025-2026	
4. Description Preparation Date:	
<b>1-9-2025</b>	
5. Available Attendance Forms:	
The lectures are conducted on-campus at civil engineering department	
6. Number of Credit Hours (Total) / Number of Units (Total)	
45/2	
7. Course administrator's name (mention all, if more than one name)	
1-Ashtar Saleh Ahmed (assistant professor) <a href="mailto:aziztaher@uomosul.edu.iq">aziztaher@uomosul.edu.iq</a> 2 – Mohammed N. Jaro (assistant professor) <a href="mailto:m.jaro@uomosul.edu.iq">m.jaro@uomosul.edu.iq</a> 3- Sura Abdul Razzaq Majeed (lecturer) <a href="mailto:suraalnuaimi75@uomosul.edu.iq">suraalnuaimi75@uomosul.edu.iq</a>	
8. Course Objectives	
Course Objectives	<p>Theoretical Part:</p> <p>The Computer Applications in Theory course provides a comprehensive framework for the Stiffness Matrix Method, a powerful tool used to analyze complex and statically indeterminate structures. This method enables students to</p> <ul style="list-style-type: none"> <li>▪ identify the degrees of freedom within a system and determine the global stiffness matrix by relating joint displacements to external loads.</li> <li>▪ Through this method, students understand the complex interaction between material properties and structural geometry, providing a precise mathematical foundation for calculating internal forces and reactions in highly redundant systems.</li> </ul> <p>Practical Part:</p> <p>This course introduces students to the practical application of structural analysis and design using STAAD.Pro. It focuses on developing hands-on skills in modeling, analyzing, and designing structural systems through computer-based tools. Students will learn how to create structural models, define material and</p>

geometric properties, apply various types of loads, and perform structural analysis. The course also emphasizes interpreting analysis results, understanding structural behavior, and generating professional engineering reports. By the end of the course, students will be able to effectively utilize software tools to support real-world civil engineering design and analysis tasks.

**9. Teaching and Learning Strategies**

**Strategy**

**Theoretical Part:**

- Interactive Lectures: Explaining the fundamental principles and scientific basis of the Stiffness Matrix Method in structural analysis.
- Applied Mathematical: Training students on manual calculation steps and matrix operations to deepen their understanding of structural programming.

**Practical Part:**

**Teaching Strategies (Practical Component)**

**Hands-on Learning:**  
Engaging students in direct practice using STAAD.Pro through lab exercises and guided tasks.

**Project-Based Learning:**  
Assigning real or simulated structural design and analysis projects using the software.

**Demonstration Method:**  
The instructor demonstrates step-by-step procedures and workflows within the software.

**Collaborative Learning:**  
Encouraging students to work in groups to solve problems and build structural models.

**Problem-Solving Approach:**  
Presenting real engineering problems and guiding students to analyze and solve them using the software.

**Guided Self-Learning:**  
Allowing students to explore software features independently with instructor support.

**Continuous Feedback:**  
Providing ongoing feedback to improve students' performance and correct mistakes during practice.

**10. Course Structure**

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation method
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3	3	An ability to identify and classify various structural systems and define the degrees of freedom (DOF) necessary to formulate engineering problems.	Introduction, Types of Structures & Degree of Freedom.	Attendance	In-class exercises
2	2	An ability to define the scientific assumptions of the Stiffness Matrix Method by applying fundamental principles of structural engineering and mathematics.	Stiffness Method & Assumptions.	Attendance	In-class exercises
3	3	An ability to solve structural engineering problems for trusses by constructing and applying global stiffness matrices based on analytical principles.	Stiffness Matrix of an Elastic Spring	Attendance	In-class exercises + quiz
2	2	An ability to formulate mathematical models for beam elements to produce engineering designs that meet structural requirements and constraints.	Stiffness Matrix for beam element	Attendance	In-class exercises
4	4	An ability to analyze and solve complex beam problems, applying synthesis in the design process to determine internal forces and displacements accurately.	Solving problems on the analysis of beam elements by the stiffness matrix method (beam examples)	Attendance	In-class exercises + quiz
<b>Practical Part:</b>					
1	2	This course introduces students to the practical application of structural analysis and design using STAAD.Pro.	Introduction to the Staad Pro program.	Attendance	In-lab exercises

3	6	Students will learn how to create structural models, define material and geometric properties, apply various types of loads, and perform structural analysis.	Analysis of beam and frame under different types of loadings.	Attendance	In-lab exercises
3	6	The course also emphasizes interpreting analysis results, understanding structural behavior, and generating professional engineering reports.	Analyze and design multi-story buildings.	Attendance	In-lab exercises+ quiz
1	2	This lecture introduces students to the practical application of PAXIS.	Introduction to Plaxis 2D	Attendance	In-lab exercises
2	4	This lecture introduces students to the practical application of foundation settlement of sandy soil	Settlement of a circular flexible footing on sand	Attendance	In-lab exercises
2	4	This lecture introduces students to the practical application of foundation settlement of clayey soil	Settlement of a circular rigid footing on sand	Attendance	In-lab exercises
2	4	This lecture introduces students to the practical application of embankment settlement	Construction of road embankment	Attendance	In-lab exercises+ quiz

**Learning and Teaching Resources:**

Prescribed textbooks (syllabus books, if available)	None
Main references (sources)	<ul style="list-style-type: none"> <li>▪ Kassimali, A. Matrix Analysis of Stru Brooks/Cole Publishing Company, 20</li> <li>▪ Paz, M. Matrix Structural Analysis and Dynamics, Theory and Computation. 2009.</li> </ul>
Recommended supporting books and references (scientific journals, reports...)	None

Electronic references, websites	<a href="https://www.youtube.com/watch?v=3Lr3k&amp;list=PLjJwBYxz7CynggZ73x0aKm2hus">https://www.youtube.com/watch?v=3Lr3k&amp;list=PLjJwBYxz7CynggZ73x0aKm2hus</a>
Curriculum or course description update rate	25%

  
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## Course Description Form

<b>1. Course Name:</b>					
Estimation					
<b>2. Course Code:</b>					
CE407					
<b>3. Semester / Year:</b>					
2025-2026					
<b>4. Description Preparation Date:</b>					
1-9-2025					
<b>5. Available Attendance Forms</b>					
presence					
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>					
30 hours / units (2)					
<b>7. Course administrator's name (mention all, if more than one name)</b>					
Name: Mohammed Ghanim Email:mohammed_g72@uomosul.edu.iq					
<b>8. Course Objectives</b>					
<b>Course Objectives</b>		Identify the types of estimation Train students to calculate quantities for construction work Train students to create quantity tables Explain how to create engineering arms			
<b>9. Teaching and Learning Strategies</b>					
<b>Strategy</b>		Dividing construction work into sections, calculating the quantities of each section and the quantities of construction materials, teaching and training students to calculate the quantities of construction materials needed for various civil engineering works, and teaching students to create quantity tables and include the appropriate sections for construction work.			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation method
1-2	4	Interdiction of Quantity survey & Rough estimation	Quantity survey	Explanation with data show	Daily tests
3-4	4	Quantities of Building Materials (concrete block, Bricks, thermestone & Stone construction	Construction work	Explanation with data show	Daily tests
5-6	4	Construction works and Bill of Quantities	Bill of quantity	Explanation with data show	Daily tests

7-8	4	Reinforced concrete works estimate	Reinforced concrete	Explanation with data show	Daily tests
9-12	8	Earth work Estimation	Earth work	Explanation with data show	Daily tests
13-14	4	Technical specifications for construction works	Specification work	Explanation with data show	Daily tests

**Learning and Teaching Resources:**

Prescribed textbooks (syllabus books, if available)	"التخمين والمواصفات" مدحت فضيل
Main references (sources)	التخمين والمواصفات القياسية" م.د. لوى محمد عباس الشذر / جامعة الكوفة
Main references (sources) and references (scientific journals, reports...)	
Main references (sources)	
Main references (sources) or course description update rate	

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## Course Description Form

<b>1. Course Name:</b>					
Structural Drawing					
<b>2. Course Code:</b>					
CE408					
<b>3. Semester / Year:</b>					
First semester / 2026					
<b>4. Description Preparation Date:</b>					
1-9-2025					
<b>5. Available Attendance Forms</b>					
In person attendance					
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>					
30/2					
<b>7. Course administrator's name (mention all, if more than one name)</b>					
Zena Adel / Lecturer Ahmed A. Mohammed Ali / Lecturer					
<b>8. Course Objectives</b>					
<b>Course Objectives</b>		In this course, students will gain proficiency: <ol style="list-style-type: none"> <li>1. Learning how to use the ACI Detailing Manual</li> <li>2. Enabling students to draw structural and architectural plans.</li> <li>3. Enabling students to read structural and architectural plans</li> </ol>			
<b>9. Teaching and Learning Strategies</b>					
<b>Strategy</b>		The main strategy to be followed in delivering this course is to encourage students to actively participate in exercises, while simultaneously refining and expanding their skills in reading drawings and developing critical thinking. This will be achieved through classroom sessions and interactive lessons.			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation method
1	2	<ul style="list-style-type: none"> <li>● General review of the Engineering Drawing with an Introduction to the Topic.</li> <li>● Types of lines used in structural drawing.</li> </ul> Naming the drawing sheets.			
2	2	<ul style="list-style-type: none"> <li>● R.C. footing with the descriptions of different types.</li> <li>● Wall footings.</li> </ul>			

		Isolated footings.			
3	2	<ul style="list-style-type: none"> <li>Continuous footing.</li> </ul> Combined footing.			
4	2	<ul style="list-style-type: none"> <li>Raft foundation</li> </ul>			
5	2	<ul style="list-style-type: none"> <li>R.C. Columns.</li> <li>Columns key plan.</li> </ul> Columns Schedule.			
6	2	<ul style="list-style-type: none"> <li>R.C. slabs – one-way slabs and two-way slabs.</li> <li>Slab plans.</li> <li>Slab sections.</li> </ul> Slab Dimensions and reinforcement.			
7	2	Beams and girders and their details			
8	2	<ul style="list-style-type: none"> <li>Stairs (types of stairs).</li> </ul> Stair's plan and positions.			
9	2	Stairs Sections.			
10	2	Steel structures and its connections.			
11	2	Column – column connections.			
12	2	Beam – column connections.			
13	2	Steel column – footing			
14	2	Power point presentation.			
15	2	Practical lecture for reading sheet plan samples			

**Learning and Teaching Resources:**

Prescribed textbooks (syllabus books, if available)	-
<input type="checkbox"/> Main references (sources)	<ul style="list-style-type: none"> <li>" Construction Drawing by Dr. Rabe (2020)</li> <li>ACI Detailing Manual.</li> </ul>
<input type="checkbox"/> Recommended supporting books and references (scientific journals, reports...)	-
<input type="checkbox"/> Main references (sources)	-
<input type="checkbox"/> Main references (sources) description update rate	The curriculum/course description is reviewed updated annually

  
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## Course Description Form

<b>1. Course Name:</b>	
Architectural Design	
<b>2. Course Code:</b>	
CE409	
<b>3. Semester / Year:</b>	
Fall Semester (First) / 2025	
<b>4. Description Preparation Date:</b>	
1/ 9 / 2025	
<b>5. Available Attendance Forms:</b>	
Personal attendance - once a week	
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>	
30 / 2 units	
<b>7. Course administrator's name (mention all, if more than one name)</b>	
Name: Asst. Lect. Shahd Nazim Sheet      Email: <a href="mailto:shahad.sheet@uomosul.edu.iq">shahad.sheet@uomosul.edu.iq</a>	
<b>8. Course Objectives</b>	
<b>Course Objectives</b>	<ul style="list-style-type: none"><li>● Enhance students' ability to think creatively while formulating structural solutions for architectural designs, which is the main subject of the course, with a focus on understanding design principles such as function, form, proportion, lighting, ventilation, and functional relationships between spaces.</li><li>● Study the structure of a building and its integration with the functional needs of the design.</li><li>● Improve the ability to find creative structural solutions that meet user needs and keep pace with technological developments.</li><li>● Apply a sound design concept and methodology that takes into account the human factor in the use of work in the field of civil engineering.</li><li>● Promote creative ideas by leveraging students' temperaments, attitudes, and personal characteristics to provide opportunities for students when formulating engineering and structural solutions.</li><li>● Enhance creative thinking by developing students' knowledge of relevant case studies.</li><li>● Improve students' ability to persevere and persist in developing the concept of design innovation for the structural structure and its inspiring role in achieving architectural creativity.</li></ul>

## 9. Teaching and Learning Strategies

<b>Strategy</b>	<ul style="list-style-type: none"> <li>● Lecture-based teaching method</li> <li>● Creative thinking method using brainstorming techniques by posing in-depth questions with open-ended answers.</li> </ul>
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## 10. Course Structure

Week	Hours	Required Learning	Unit or subject name	Learning method	Evaluation
		Outcomes			method
1	2	Clarifying the relationship between architecture and civil engineering	Introduction and definition of the topic		
2	2	Delivering knowledge related to the basics of architectural design and its relationship to civil engineering	Architectural design and its importance	Directed lecture	Daily evaluation
3	2	Delivering knowledge related to the basics of architectural design and its relationship to civil engineering	The formation system in architecture	Directed lecture	Daily evaluation
4	2	Delivering knowledge related to the basics of architectural design and its relationship to civil engineering	Organized relationships in the formation of architecture	Directed lecture	Daily evaluation
5	2	Delivering knowledge related to the basics of architectural design and its relationship to civil engineering	Design principles	Directed lecture	Daily evaluation
6	2	Delivering knowledge related to the basics of architectural design and its relationship to civil engineering	The concept of uniqueness in architecture	Directed lecture	Daily evaluation
7	2	Delivering knowledge related to the basics of architectural design and its relationship to civil engineering	Architectural design determinants	Directed lecture	Daily evaluation

8	2	Delivering knowledge related to the basics of architectural design and its relationship to civil engineering	Scale and proportion	Directed lecture	Daily evaluation
9	2		exam		
10	2	Delivering knowledge related to the basics of architectural design and its relationship to civil engineering	The golden ratio	Directed lecture	Daily evaluation
11	2	Delivering knowledge related to the basics of architectural design and its relationship to civil engineering	Mass and space	Directed lecture	Daily evaluation
12	2	Delivering knowledge related to the basics of architectural design and its relationship to civil engineering	Islamic architecture	Directed lecture	Daily evaluation
13	2	Enhance the ability to understand and apply	Analyze examples and discuss reports	Group discussion	Report evaluation
14	2	The ability to consider diverse viewpoints and reach informed conclusions.	Discussing real-life examples in civil engineering	Group discussion	Daily evaluation
15	2		Midterm exam		Final evaluation
Course Evaluation and Grade Breakdown:			Scheme analysis - 5 marks Quiz - 5 marks Report discussion - 10 marks Midterm exam - 15 marks Attendance and daily assignments - 5 marks Total: 40 marks		
Learning and Teaching Resources:					
1- Joseph De Chiara, "Time-Saver Standards for Building Types."					

2- Ernst Neufert , "Neufert Architects' Data"

3- Architecture: Form, Space, and Order” by Francis D.K. Ching

4- “Fundamentals of Architecture” – Written by: Muhammad Hussein Hamdan

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## Course Description Form

University of Mosul

College of Engineering

Department: Civil Engineering

1. Course Name:					
Reinforced Concrete Design_II					
2. Course Code:					
CE411					
3. Semester / Year:					
2025-2026					
4. Description Preparation Date:					
1-9-2025					
5. Available Attendance Forms					
Attending Lecture					
6. Number of Credit Hours (Total) / Number of Units (Total)					
60/3					
7. Course administrator's name (mention all, if more than one name)					
- Dr. Suhaib Y. Kasim Al-Darzi. (Professor)					
- Dr. Muna M. Hano (Assistant Professor)					
8. Course Objectives					
Course Objectives	<p>The students will be familiar with the analysis and design prestressed reinforced concrete members, and RC bridges considering the international codes in design as ACI and AASHTO codes to make the student able to understand and start working in the design field.</p> <p>On completion of the course the student will be able to:</p> <p style="padding-left: 40px;">Analysis of prestress flexural members, Design of prestress flexural members, and Design of RC Bridges.</p>				
9. Teaching and Learning Strategies					
Strategy	Lectures, Videos, Assignments				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation method
1	4	2	Introduction: Review the principles of precast reinforced concrete design	ATTEND	
2	4	2	Precast construction advantages and disadvantages. Prefabricated elements, dimension limitations.	ATTEND	
3	4	2	Types of joints connections. Shear friction theory Design of brackets and corbels.	ATTEND	
4	4	2	Design Examples Brackets. End beam.	ATTEND	
5	4	2	Homework, Tutorial, Quiz	ATTEND	
6	4	2	The principles of prestressing, theory and method of load applying. Material properties and types, prestressed and ordinary steel high strength concrete.	ATTEND	

7	4	2	Types and methods of prestressing. Stress analysis at different load stages.	ATTEND	
8	4	2	Principles limit stress at initial and after losses. Cracking, cracking load and factor against cracking.	ATTEND	
9	4	2	Ultimate strength of prestressed concrete and factor of safety. Types of losses in prestressed concrete.	ATTEND	
10	4	2	Lump sum losses estimation Detailed estimation of losses in prestressed concrete.	ATTEND	
11	4	2	Tutorial, Quiz	ATTEND	
12	4	2	Type of loading used for bridges design. Design of slab bridge and edge beam.	ATTEND	
13	4	2	Deck girder bridges, span length, minimum depth, loading criteria. Shear and flexural stress calculation at different sections along the span.	ATTEND	
14	4	2	Design for deck reinforcement, girders flexural and diagonal reinforcement. Design for exterior girders and intermediate diaphragms. Homework, Tutorial, Quiz	ATTEND	
15			Final Exam		

  
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Learning and Teaching Resources:

<b>Prescribed textbooks (syllabus books, if available)</b>	1. Design of reinforced concrete structures, A.H Nilson, 2010. 2. Design of Prestressed Concrete, A.H. Nilson, 2nd Edition.
☐ <b>Main references (sources)</b>	1. Building Code Requirements for Structural Concrete and Commentary (ACI 318M-19), 2019. 2. AASHTO LRFD Bridge, 3rd Edition, SI units, Published by the American Institute of State Highway and Transportation Officials, 2010
☐ <b>Main references (sources) and references (scientific journals, reports...)</b>	
☐ <b>Main references (sources)</b>	
☐ <b>Main references (sources) description update rate</b>	

Course Instructor

Head of Department

Professor Dr. Suhaib Y. Kasim Al-Darzi.

Assist. Prof. Dr. Baraa J. Mahmood

## Course Description Form

<b>1. Course Name:</b>					
Foundation Engineering II					
<b>2. Course Code:</b>					
CE412					
<b>3. Semester / Year:</b>					
Spring - 2026					
<b>4. Description Preparation Date:</b>					
1-9-2025					
<b>5. Available Attendance Forms</b>					
In-person attendance					
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>					
3/60					
<b>7. Course administrator's name (mention all, if more than one name)</b>					
Dr. Abdulrahman Hani Aldaood Dr. Muwafaq Abbo Awad					
<b>8. Course Objectives</b>					
<b>Course Objectives</b>		Calculating ultimate pile load capacity, understanding analysis and design of deep foundation, design problem-solving techniques, processing pile load test results, and calculating settlement of pile foundation. Retaining system (retaining walls and sheet piles)			
<b>9. Teaching and Learning Strategies</b>					
<b>Strategy</b>		<ol style="list-style-type: none"> <li>1. Encouraging students to express their opinions</li> <li>2. The ability to provide explanations for the solutions they have reached</li> <li>3. Diversifying teaching methods used to achieve objectives</li> <li>4. Cooperative learning to enhance students' ability to find diverse solutions</li> <li>5. Using real-world examples of engineering problems and proposing appropriate solutions for them</li> </ol>			
<b>10. Course Structure</b>					
<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or Subject Name</b>	<b>Learning Method</b>	<b>Evaluation method</b>
1	4	Students will learn information about piles types	Definition, types of piles, and their structural characteristics	In-person attendance- power point	In-class activity
2	4	Students will learn information about pile installation and mechanisms of pile load transfer	Estimating pile length, point bearing pile, friction piles, installation of piles, load transfer mechanisms	In-person attendance- power point	Quiz

3	4	Students will learn about calculating ultimate pile load capacity of pile in sand	Pile capacity in cohesionless soils with examples	In-person attendance-solving problems	Quiz
4	4	Students will learn about calculating ultimate pile load capacity in clay	Pile capacity in cohesive soils with examples	In-person attendance-solving problems	Quiz
5	4	Students will learn information about pile capacity in c- $\phi$ soils	Pile capacity of c- $\phi$ soils	In-person attendance-power point	In-class activity
6	4	Students will learn about calculating ultimate pile load capacity of pile group	Group of piles and pile group efficiency with examples	In-person attendance-solving problems	Homework
7	4	Students will learn information about the theories of lateral earth pressures.	Pile subjected to moment and pile load test	In-person attendance-power point	In-class activity
8	4	Students will learn about calculating pile settlement	Settlement of piles and pile groups Mid-term exam	In-person attendance-solving problems	In-class activity
9	4	Students will learn information about the theories of lateral earth pressures.	Introduction to lateral earth pressure theory-Rankine Horizontal surface -problems	In-person attendance-power point	In-class activity
10	4	Students will learn about calculating lateral earth pressures	Rankine lateral earth pressure theory-inclined surface-problems	In-person attendance-solving problems	Quiz
11	4	Students will learn about calculating lateral earth pressures	Coulomb active and passive lateral earth pressure theory- problems	In-person attendance-solving problems	Homework
12	4	Students will learn information about the retaining structures.	Definitions, types of retaining walls, geotechnical proportioning of retaining walls, Applications of lateral earth pressure theories, stability of retaining walls against overturning	In-person attendance-power point	In-class activity
13	4	Students will learn about evaluating stability of retaining walls	Stability of retaining walls against overturning and sliding -problems	In-person attendance-solving problems	Homework
14	4	Students will learn about designing sheet	Introductions, types of sheet piles, applications,	In-person attendance-	In-class activity

		pile walls	construction methods, cantilevered sheet piles penetrating sand	power point	
15	4	Students will learn about designing sheet pile walls	Sheet piles penetrating clay- problems	In-person attendance- solving problems	Quiz
			Final exam		

#### Learning and Teaching Resources:

Prescribed textbooks (syllabus books, if available)	Principal of Foundation Engineering by Braja Das
☐ Main references (sources) (sources)	Design of Reinforced Concrete Foundations, by P.C. VARGHESE, Asoke K. Ghosh, PHI Learning Private Limited, 2010.  - Foundation analysis and design, by Bowles, J. E., & Guo, Y., New York: McGraw-Hill, 1998.
☐ Recommended supporting books and references (scientific journals, reports...)	
☐ Main references (sources) websites	
☐ Main references (sources) description update rate	10%

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## Course Description Form

<b>1. Course Name:</b>	
Steel design II	
<b>2. Course Code:</b>	
CE413	
<b>3. Semester / Year:</b>	
Spring/ 2025-2026	
<b>4. Description Preparation Date:</b>	
1-5-2025	
<b>5. Available Attendance Forms</b>	
Attendance	
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>	
45/2	
<b>7. Course administrator's name (mention all, if more than one name)</b>	
Assistant Professor Dr. Baraa J. Mahmood Assistant Professor Dr. Kaythar A. Ibrahim	
<b>8. Course Objectives</b>	
<b>Course Objectives</b>	<p>Introduce students to the fundamental design process of steel as a structural member, which is found in bridges and building structures.</p> <p>The AISC LRFD Code is the design specifications choice used in this course.</p> <p>Understanding the relationship between analysis and design of steel structures by applying knowledge from statics, mechanics of solids, and structural analysis further.</p> <p>In this course, the students learn how to analyze the steel members under different loading conditions. In addition to the connection between members.</p>
<b>9. Teaching and Learning Strategies</b>	
<b>Strategy</b>	<p>The main strategy for delivering this module will be to encourage students' participation in the exercises while refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and simple, student-interesting sampling experiments.</p>
<b>10. Course structures</b>	

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation method
1	3	At the end of this course, students will have gained knowledge of the fundamental concepts behind the design of structural steel, as well as instruction in the most recent design and analysis methods for steel structural elements. Understand the design criteria, LRFD design philosophy, and behavior of structural steel according to ANSI/AISC 360-16 - An American National Standard (Specification for Structural Steel Buildings). Learning how to use the AISC (American Institute of Steel Construction Manual). Calculate the acceptable design loading for steel members. 5. Able to analyze and design beam elements under flexure and beam-column elements under axial and bending loading. Able to analyze and design simple connections between structural elements.	Review of steel design I and structural Loading, review of axial member design concepts, load combinations for bending and combined actions, and structural analysis results interpretation.	Lectures, problem-solving sessions, and design assignments	Assignments, quizzes, and exams
2	3		Behavior of flexural Members, stress distribution in bending, elastic vs plastic behavior, plastic moment concept, influence of cross-sectional shape (shape factor).		
3	3		Section classification, compact, non-compact, and slender sections, local buckling behavior, width-to-thickness limits, and the effect of section classification on design strength.		
4	3		Design of flexural members (strength limit state), flexural strength equations, design of laterally supported beams, LRFD and ASD checks, and selection of economical sections.		
5	3		Lateral-torsional buckling (LTB) of beams, mechanism of lateral-torsional buckling, unbraced length concept, $C_b$ factor, elastic and inelastic buckling regions.		
6	3		Design of beams using equations and charts.		
7	3		Shear of beam and deflection limits.		
8	3		Introduction to beam-column members, combined axial force and bending, $P-\Delta$ and $P-\delta$ effects, and interaction between axial load and moment.		
9	3		Beam-column interaction equations, interaction diagrams, code-based interaction equations, and design philosophy for combined loading.		
10	3		Beam-columns under uniaxial bending, design procedure for uniaxial bending, moment amplification, and stability checks.		
11	3		Beam-columns under biaxial bending, biaxial bending behavior, and application of interaction equations.		
12	3		Introduction to steel connections, load transfer mechanisms in connections, and types of steel connections.		
13	3		Bolted connections, bearing-type and slip-critical connections, design of bolts and connection elements.		
14	3		Welded connections, types of welds and welding symbols, and strength and design of welded joints.		
15	3		Integrated design and review, integrated member and connection design.		

## 11. Learning and Teaching Resources

Prescribed textbooks (syllabus books, if available)

Main references (sources)	
Recommended supporting books and references (scientific journals, reports...)	Structural Steel Design, Jack C. McCormac and Stephen F. Csernak, Pearson Education Limited, 6 <sup>th</sup> edition, 2018. AISC Construction Manual, 15 <sup>th</sup> Edition. 2017
Electronic references, websites	
Curriculum or course description update rate	5%

  
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## Course Description Form

University : Mosul

College : Engineering

Department : Civil

1. Course name and academic level	
Traffic Engineering II / Fourth Year	
2. Course code	
CE 414	
3. Semester/Year	
Second / 2025- 2026	
4. Date this description was prepared	
1 / 9 / 2025	
5. Available forms of attendance	
Attendance in the classroom according to the weekly lesson schedule	
6. Number of study hours (total) / Number of units (total)	
2 hours of theory per week( 30 hours total) / 2 units	
7. Name of the course supervisor and academic title	
Dr. Mohammed Yasseen Taha / Assistant Professor Email: <a href="mailto:mohammedtaha@uomosul.edu.iq">mohammedtaha@uomosul.edu.iq</a>	
8. Scientific course objectives	
Subject objectives	<ul style="list-style-type: none"><li>▪ Understand the general principles of traffic engineering and the characteristics of traffic engineering</li><li>▪ Identify the role of traffic engineering within transportation engineering in life</li><li>▪ Analyze and design data for traffic characteristics and find the LOS for freeways</li><li>▪ Analyze and design data for traffic characteristics and find the LOS for multi-lane highways</li><li>▪ Study and classify intersections of all types on the road network</li><li>▪ Analyze and evaluate the signalized intersections performance.</li><li>▪ Analyze and design of parking.</li></ul>
9. Teaching and learning strategies	
The student acquires knowledge of the characteristics of traffic engineering and the ability to distinguish, define, analyze and address the most important engineering and mathematical problems and issues in the field of traffic engineering and for specific types of roads distributed on the urban and rural road network and the method of finding the necessary immediate and future solutions and developing the appropriate design and planning for each of them.	
10. Course Structure	

Week	Hours	Required learning outcomes		Learning method	Evaluation method
1	2	Learn about the methods of evaluating and analyzing the types of roads found in the urban and rural road network and how to find their capacity and level of service with the most important principles of design and future planning.	Introduction to Traffic Engineering Studies	Students' attendance in the classroom and through the educational tools available inside the classroom, with some site visits.	According to the tasks assigned to the student, such as daily preparation, daily, oral, monthly and written exams, and reports.
2	2		Study of parking, their types, design, importance and impact on traffic		
3	2		Definition and classification of freeways and identification of their parts		
4	2		Study the factors affecting freeway traffic		
5	2		Analysis of traffic characteristics in basic segment freeway		
6	2		Finding the level of service in basic segment freeway		
7	2		Design and planning of traffic in basic segment freeway		
8	2		Definition and classification of multi-lane roads and their sections		
9	2		Analysis of traffic characteristics in multi-lane highways		
10	2		Finding the level of service in multi-lane highways		
11	2		Design and planning of traffic in multi-lane highways		
12	2		Definition and classification of traffic intersections and their functions		
13	2		Study of methods of analyzing the signalized intersections		
14	2		Design and timing for the signalized intersections		
15	2		Evaluation of traffic operation at the signalized intersections		

#### 11. Course Evaluation and Grade Divisions

Daily attendance and preparation = 10 marks    Daily homework and exam = 10 marks  
 Reports = 5 marks                      Monthly exams = 15 marks                      Final exam = 60 marks

#### 12. Learning and teaching references

Required textbooks (methodology if any)	Highway Capacity Manual 2010, 2016 (Fifth & Sixth editions)
Main References (Sources)	Nicholas J. Garber, and Lester A. Hoel, " <i>Traffic and Highway Engineering</i> ", Fourth Edition, Cengage Learning, Toronto, Canada, pp. 99-150, 2009.
Recommended supporting books and references (scientific journals, reports...)	Not specified only within the field of traffic engineering and according to the titles
Electronic references, Internet sites	Not specified only within the field of traffic engineering and according to the titles
Curriculum update rate or description	10 %

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## Course Description Form

<b>1. Course Name:</b>	
Sanitary Engineering II	
<b>2. Course Code:</b>	
CE415	
<b>3. Semester / Year:</b>	
Spring / 2025-2026	
<b>4. Description Preparation Date:</b>	
1-9-2025	
<b>5. Available Attendance Forms</b>	
In-person	
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>	
30/2	
<b>7. Course administrator's name (mention all, if more than one name)</b>	
Yousif hassan najim	
<b>8. Course Objectives</b>	
<b>Course Objectives</b>	<p>To introduce students to the fundamental concepts of water supply and sewerage systems, including their principal components and the function of each component.</p> <p>To enable students to understand the engineering and hydraulic principles adopted in the design of water distribution networks and sewerage systems.</p> <p>To equip students with the ability to collect and analyze design data, such as population data, topographic information, water consumption, and expected discharges.</p> <p>To train students to calculate the design discharges of water supply and sewerage networks in accordance with relevant engineering standards and codes.</p> <p>To develop students' ability to design pipelines and select diameters, slopes, pressures, and operating depths in a manner that achieves technical and economic efficiency.</p> <p>To familiarize students with the design requirements of auxiliary network elements such as reservoirs, manholes, pumping stations, lifting stations, and various operational appurtenances.</p> <p>To develop students' skills in reading engineering drawings and longitudinal profiles and in preparing preliminary design solutions for networks.</p> <p>To strengthen students' ability to integrate technical, health, environmental, and safety considerations in the design of water supply and sewerage systems.</p> <p>To provide students with the skill to evaluate design alternatives and select appropriate solutions in terms of operational efficiency, sustainability, and ease of maintenance.</p>
<b>9. Teaching and Learning Strategies</b>	

<b>Strategy</b>	This course consists of several components, including lectures, individual and group assignments, and e-learning platforms. The course will be taught in English, and all compulsory assignments must be submitted by the specified deadlines for students to be eligible to sit for the examinations.
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### 10. Course Structure

<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
1	2	Students should distinguish between the components and types of water supply and sewerage networks and explain the general sequence of the design process.	Introduction to Water Supply and Sewerage Systems	PowerPoint lecture	quiz
2	2	Students should identify the data required before commencing design and relate each type of data to its impact on design decisions.	Design Data and Engineering Surveying	PowerPoint lecture	Homework & quiz
3	2	Students should compare water sources and select the most appropriate source on the basis of quantitative, qualitative, and economic considerations.	Water Sources and Components of the Water Supply System	PowerPoint lecture	Homework
4	2	Students should apply basic hydraulic principles in water supply line calculations and in selecting preliminary pipe materials.	Hydraulic Fundamentals of Water Supply Networks	PowerPoint lecture	Homework & quiz
5	2	Students should select an appropriate network layout and justify the selection according to the	Planning of Water Distribution Networks	PowerPoint lecture	quiz

		nature of the area and the required level of service.			
6	2	Students should design sections of a water supply network in terms of diameters, discharges, and permissible pressures.	Hydraulic Design of Water Supply Networks	PowerPoint lecture	Homework & quiz
7	2	Students should determine preliminary storage capacity, pumping requirements, and essential appurtenances for a water supply network.	Reservoirs, Pumping Stations, and Network Appurtenances	PowerPoint lecture	quiz
8	2	Students should complete a simplified preliminary design for a water supply network and review common design errors.	Practical Applications and Review of Water Supply Network Design	PowerPoint lecture	quiz
9	2	Students should explain the types of sewerage networks, their fields of application, and the basic requirements for each type.	Introduction to Sewerage Networks and Their Types	PowerPoint lecture	Homework & quiz
10	2	Students should calculate the design discharge of a sewerage network while considering peak factors, infiltration, and different loadings.	Estimation of Discharges in Sewerage Networks	PowerPoint lecture	quiz
11	2	Students should apply gravity-flow criteria and determine appropriate velocities and slopes to prevent sedimentation or scouring.	Hydraulic Principles for Sewer Design	PowerPoint lecture	quiz

12	2	Students should design gravity sewer lines in terms of diameters, slopes, and operating depths.	Hydraulic Design of Sewer Lines	PowerPoint lecture	Homework & quiz
13	2	Students should determine the locations and characteristics of manholes and lifting stations and distinguish cases that require pumping.	Manholes, Appurtenances, and Lifting Stations	PowerPoint lecture	quiz
14	2	Students should read drawings and longitudinal profiles and set out an appropriate network alignment according to topography.	Planning of Sewerage Networks and Reading Longitudinal Profiles	PowerPoint lecture	quiz
15	2	Students should observe coordination, safety, and environmental requirements when preparing an integrated network design.	Integration between Water Supply and Sewerage Networks and Environmental Aspects	PowerPoint lecture	quiz

#### Learning and Teaching Resources:

Prescribed textbooks (syllabus books, if available)	Water Supply and Sewerage by E.W. Steel & Terence J. McG (1990).
— Main references (sources)	Water and Wastewater Engineering, Mackenzie L. Davis, PhD, PE, BCEE (2010). Design of Water Supply Pipe Networks, John Wiley & Sons (2008).
— Main references (sources) references (scientific journals, reports...)	
— Main references (sources)	
— Main references (sources)	5 %

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## Course Description Form

<b>1. Course Name:</b>	
Computer application II	
<b>2. Course Code:</b>	
CE416	
<b>3. Semester / Year:</b>	
2nd Semester/2025-2026	
<b>4. Description Preparation Date:</b>	
1-9-2025	
<b>5. Available Attendance Forms:</b>	
The lectures are conducted on-campus at civil engineering department	
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>	
45/2	
<b>7. Course administrator's name (mention all, if more than one name)</b>	
1-Ashtar Saleh Ahmed (Assistant professor) <a href="mailto:aziztaher@uomosul.edu.iq">aziztaher@uomosul.edu.iq</a>	
2- Mohammed N. Jaro <a href="mailto:m.jaro@uomosul.edu.iq">m.jaro@uomosul.edu.iq</a>	
3- Sura Abdul Razzaq Majeed (lecturer) <a href="mailto:suraalnuaimi75@uomosul.edu.iq">suraalnuaimi75@uomosul.edu.iq</a>	
<b>8. Course Objectives</b>	
<b>Course Objectives</b>	<p>Theoretical Part: The Computer Applications in Theory course provides a comprehensive framework for the Stiffness Matrix Method, a powerful tool used to analyze complex and statically indeterminate structures. This method enables students to</p> <ul style="list-style-type: none"> <li>▪ identify the degrees of freedom within a system and determine the global stiffness matrix by relating joint displacements to external loads.</li> <li>▪ Through this method, students understand the complex interaction between material properties and structural geometry, providing a precise mathematical foundation for calculating internal forces and reactions in highly redundant systems.</li> </ul> <p>Practical Part: This course introduces students to the practical application of structural analysis and design using STAAD.Pro. It focuses on developing hands-on skills in modeling, analyzing, and designing structural systems through computer-based tools. Students will learn how to create structural models, define material and geometric properties, apply various types of loads, and perform structural analysis. The course also emphasizes interpreting analysis results, understanding structural behavior, and generating professional engineering reports. By the end of the course, students will be able to effectively utilize software tools to support real-world civil engineering design and analysis tasks.</p>
<b>9. Teaching and Learning Strategies</b>	
<b>Strategy</b>	<p>Theoretical Part:</p> <ul style="list-style-type: none"> <li>- Interactive Lectures: Explaining the fundamental principles and scientific basis of the Stiffness Matrix Method in structural analysis.</li> <li>- Applied Mathematical: Training students on manual calculation steps and matrix operations to deepen their understanding of structural programming.</li> </ul>

Practical Part:  
 Teaching Strategies (Practical Component)  
 Hands-on Learning:  
 Engaging students in direct practice using STAAD.Pro through lab exercises and guided tasks.  
 Project-Based Learning:  
 Assigning real or simulated structural design and analysis projects using the software.  
 Demonstration Method:  
 The instructor demonstrates step-by-step procedures and workflows within the software.  
 Collaborative Learning:  
 Encouraging students to work in groups to solve problems and build structural models.  
 Problem-Solving Approach:  
 Presenting real engineering problems and guiding students to analyze and solve them using the software.  
 Guided Self-Learning:  
 Allowing students to explore software features independently with instructor support.  
 Continuous Feedback:  
 Providing ongoing feedback to improve students' performance and correct mistakes during practice.

### 10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation method
3	3	Ability to formulate and solve engineering problems for continuous beams using the stiffness matrix, and utilizing analysis results to produce structural designs.	Analysis of continuous beam using stiffness matrix method	Attendance	In-class exercises
1	1	Ability to define and solve structural problems for plane trusses computationally, and synthesizing their elements to design integrated systems.	Plane trusses	Attendance	In-class exercises
4	4	Ability to define and solve structural problems for plane trusses computationally, and synthesizing their elements to design integrated systems	Solving problems on the analysis of a plane truss by the stiffness matrix method	Attendance	In-class exercises + quiz
3	3	Ability to apply science and mathematics principles to derive stiffness matrices for 2D frames, using them as a fundamental analytical tool in the engineering design process to ensure structural stability under various loading conditions.	2D Frame element	Attendance	In-class exercises
4	4	Ability to practically solve and apply 2D frame analysis problems using the stiffness matrix method	Solving problems on the analysis of a 2D frame element by the stiffness matrix method	Attendance	In-class exercises + quiz
3	6	analyzing, and designing structural systems through computer-based tools. Students will learn how to create structural models, define material and geometric properties, apply various types of loads, and perform structural analysis.	Analyze and design footings and retaining structures.	Attendance	In-lab exercises
3	6	Students will learn how to create structural models, define material and geometric properties, apply various types of loads, and perform structural analysis. By the end of the course, students will be able to effectively utilize software tools to support real-world civil engineering design and analysis tasks.	Comparing the results of design with specifications.	Attendance	In-lab exercises
1	2	The course also emphasizes interpreting analysis results, understanding structural behavior,	Engineering report preparation.	Attendance	In-lab exercises + quiz

		and generating professional engineering reports.			
1	2	Introduction to PLAXIS dynamic	Introduction to Plaxis 2D dynamic	Attendance	In-lab exercises
2	4	Building subjected to an earthquake	Vibration analysis of building subjected to an earthquake	Attendance	In-lab exercises
2	4	Vibration due to Pile driving	Vibration analysis during pile driving	Attendance	In-lab exercises
2	4	Vibration due to machine operation	Vibration analysis of machine	Attendance	In-lab exercises + quiz

#### Learning and Teaching Resources:

Prescribed textbooks (syllabus books, if available)	None
Main references (sources)	<ul style="list-style-type: none"> <li>▪ Kassimali, A. Matrix Analysis of Structures. Brooks/Cole Publishing Company, 2011.</li> <li>▪ Paz, M. Matrix Structural Analysis and Dynamics: Theory and Computation. CSI, 2009.</li> </ul>
Recommended supporting books and references (scientific journals, reports...)	None
Electronic references, websites	<a href="https://www.youtube.com/watch?v=3Lr3kITURdc&amp;list=PLyZ7CynggZ73x0aKm2hus63jEhSh">https://www.youtube.com/watch?v=3Lr3kITURdc&amp;list=PLyZ7CynggZ73x0aKm2hus63jEhSh</a>
Curriculum or course description update rate	25%

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## Course Description Form

<b>1. Course Name:</b>					
Construction Methods					
<b>2. Course Code:</b>					
CE417					
<b>3. Semester / Year:</b>					
SPRING Semester /2025-2026					
<b>4. Description Preparation Date:</b>					
1-9-2025					
<b>5. Available Attendance Forms</b>					
Attendance					
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>					
2/30					
<b>7. Course administrator's name (mention all, if more than one name)</b>					
Name: Riffa Dalli Shlla - Msc			Email: <a href="mailto:Reffashlla@uomosul.edu.iq">Reffashlla@uomosul.edu.iq</a>		
<b>8. Course Objectives</b>					
Course Objectives		<p style="text-align: center;">1- construction professionals, engineers and architects to understand. This knowledge helps design structures.</p> <p style="text-align: center;">2- plan projects</p> <p style="text-align: center;">3- create safe working environments</p>			
<b>9. Teaching and Learning Strategies</b>					
Strategy					
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation method
1	2		1-Introduction of Construction industry		
2	2		2-Introduction of engineering evaluation.		
3	2		3-Rolling Resistance.		

4	2		4- coefficient of Traction.		
5	2		5-Type of methods compaction soil.		
6	2		6-Soil Specification		
7	2		7-swelling and shrinkage of soil		
8	2		8-Calculation the cost of Wood Forms.		
9	2		9-Properties of Tractors.		
10	2		10-Properties of Bulldozer and productivity,		
11	2		11-Regressive of rod		
12	2		12-Foundation injection		
13	2		13- Properties of scrapers		
14	2		14-Scrapers Productivity.		
15	2		15-Term Exam		

Learning and Teaching Resources:

Prescribed textbooks (syllabus books, if available)	Planning ,equipment and construction meth for Mohammed Ayoub Sabry
Main references (sources)	Construction Methods and Estimation for Rahman Adnan.
Recommended supporting books and references (scientific journals, reports...)	
Electronic references, websites	
Curriculum or course description update rate	

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## Course Description Form

<b>1. Course Name:</b>					
Applied Chemistry					
<b>2. Course Code:</b>					
CE418					
<b>3. Semester / Year:</b>					
Spring / 2026					
<b>4. Description Preparation Date:</b>					
1-9-2025					
<b>5. Available Attendance Forms</b>					
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>					
30/2					
<b>7. Course administrator's name (mention all, if more than one name)</b>					
Dr. Eman Khalid Ibrahim <a href="mailto:emankhalid33@uomosul.edu.iq">emankhalid33@uomosul.edu.iq</a>					
<b>8. Course Objectives</b>					
<b>Course Objectives</b>	For Applied Chemistry, students will learn the information of: <ol style="list-style-type: none"> <li>1. Chemistry of cement production</li> <li>2. Specification of different types of cement</li> <li>3. Hydration process of cement and reaction products</li> <li>4. Chemical and mineral admixtures</li> <li>5. Polymers in asphalt mixes</li> <li>6. Effect of fibers on concrete properties</li> <li>7. Effect of sulfate and acid attack on concrete durability</li> <li>8. Corrosion in reinforcing and its effect on concrete durability</li> <li>9. Production of green concrete using environmentally friendly materials</li> </ol> Recycled and waste material uses and their effect on concrete properties				
<b>9. Teaching and Learning Strategies</b>					
<b>Strategy</b>	The main strategy for delivering this module will be to encourage students to get sufficient knowledge about the chemical concept of all construction materials and chemical admixtures that could be incorporated into the concrete mix design to improve its properties. Additionally, the module will analyze the chemical composition of asphalt and polymers, highlighting their unique properties. Classes, interactive tutorials, and the consideration of simple experiments involving interesting sampling activities will achieve this objective.				
<b>10. Course Structure</b>					
<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or Subject Name</b>	<b>Learning Method</b>	<b>Evaluation method</b>

1	2	Understand the chemistry of cement production to make informed decisions about material selection and quality control in construction projects.	Introduction to Chemistry of cement compounds and their properties	Theory lecture	homework
2	2	Identify and specify different types of cement for various civil engineering applications based on their properties and standards	Types of cement and their specifications	Theory lecture	
3	2	Explain the hydration process of cement and its reaction products to predict and enhance concrete performance in structural works.	Hydration of the individual cement phases and reaction products	Theory lecture	Quiz
4	2	Evaluate the use of chemical and mineral admixtures to improve workability, strength, and durability of concrete and other construction materials.	Chemical admixtures and mineral additives for concrete (including composite cements)	Theory lecture	
5	2		Mid-Term Exam		Exam
6	2	Assess the benefits of polymers in asphalt mixes and apply this knowledge to design better, longer-lasting pavements.	Asphalt and Polymers	Theory lecture	Quiz
7	2	Analyze the impact of fiber reinforcement on concrete properties to improve mechanical performance and crack resistance in infrastructure projects.	Effect of fibers on concrete properties	Theory lecture	
8	2	Recognize and mitigate the effects of sulfate and acid attacks on concrete, ensuring the longevity and durability of civil structures in aggressive environments.	Sulfate and acid attack in concrete and their effect on concrete durability	Theory lecture	
9	2	Understand the mechanisms of corrosion in reinforcing steel and develop strategies to protect and extend the lifespan of reinforced concrete structures.	Alkali-silica reaction attack and its effect on concrete durability	Theory lecture	homework
10	2	Advocate for and implement the production of green concrete by utilizing environmentally friendly materials to promote sustainability in construction.	Corrosion in reinforced concrete and its effect on concrete durability	Theory lecture	

11	2	Introducing the mechanical causes of cracks and how limited them	Mechanism of Cracks generated in plastic and hardening concrete	Theory lecture	Quiz
12	2	Introducing of sustainable materials for green concrete	Production of green concrete using environmentally friendly materials	Theory lecture	
13	2	Incorporate recycled and waste materials into concrete mixes, assessing their effects on material properties	Recycled and waste material uses and their effect on concrete properties	Theory lecture	
uiz	2	Incorporate the chemical composition of soil	Chemical Composition of Soil	Theory lecture	
15	2	Incorporate the chemical Stabilization of soil	Chemical Stabilization of Soil	Theory lecture	

#### Learning and Teaching Resources:

Prescribed textbooks (syllabus books, if available)	
☐ Main references (sources)	
☐ Main references (sources) and references (scientific journals, reports...)	<p>Nevile A.M. (1995). Properties of Concrete, fourth and final Edition-Pearson Education Limited, 846 pp.</p> <p>Troxell, Kelly, and Davis. (1968). Composition and Properties of Concrete, 2nd edition -McGraw-Hill book company, 480 pp.</p> <p>Mindess S, Young F, Darwin D. Concrete (second edition). Prentice Hall., Englewood Cliffs, NJ. 2002 Jan 1; 644 pp</p>
☐ Main references (sources)	
☐ Main references (sources) update rate	

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