الجامعة العراقية
كلية الهندسة
برنامج مسار بولونا لقسم الهندسة المدنية
2024-2023


الجامعة العراقية
كلية الهندسة
THE IRAQIA UNIVERSITY
College of Engineering

الملحق (1)
دليل المنهاج الدراسي
Curriculum

Republic of Iraq - Ministry of Higher Education and Scientific Research
Al-Iraqia University
Bachelor's degree in Civil Engineering (First cycle)
Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr
Program Curriculum (2023 - 2024)

جمهورية العراق - وزارة التعليم العالي والبحث العلمي
الجامعة العراقية
بكالوريوس في الهندسة المدنية (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة اوربية - كل وحدة اوربية = ٢٥ ساعة
المنهاج الدراسي للعام ٢٠٢٣-٢٠٢٤

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGI	One	1	UI100	Human Rights	حقوق الأنسان	Arabic	2						2	32	18	50	2.00	S	
		2	UICE101	Engineering Mechanics I	الميكانيك الهندسي 1	English	3				1		2	62	113	175	7.00	C	
		3	UICE102	Mathematics I	الرياضيات 1	English	4						2	62	88	150	6.00	B	
		4	UICE103	Construction Materials	المواد الأنشائية	Arabic	2		2				4	64	86	150	6.00	C	
		5	UICE104	Physics for Engineers	الفيزياء للمهندسين	English	2		2				2	62	63	125	5.00	B	
		6	UICE105	Engineering Drawing	الرسم الهندسي	English	1			3			2	62	38	100	4.00	C	
						Total	14	0	4	3	1	0	14	344	406	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGI	Two	1	UICE200	Workshop technology	الورشة الفنية	Arabic	1		2				2	47	53	100	4.00	S	
		2	UI201	English Language	اللغة الأنكليزية	English	1			1			2	32	68	100	4.00	S	
		3	UICE202	Engineering Mechanics II	الميكانيك الهندسي-II	English	3				1		2	62	88	150	6.00	C	UICE101
		4	UICE203	Mathematics II	الرياضيات 2	English	4						2	62	88	150	6.00	S	UICE102
		5	UICE204	Engineering Geology	الجيولوجيا الهندسية	English	3						2	47	78	125	5.00	B	
		6	UICE205	Computer Aided Graphics	الرسم بأستخدام الحاسوب	English	1		3				2	62	63	125	5.00	C	
						Total	13	0	5	1	1	0	12	312	438	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGII	Three	1	UICE300	Computer Programming	البرمجة بالحاسوب	English	1		2				2	47	53	100	4.00	S	
		2	UICE301	Mechanics of Materials I	ميكانيك المواد 1	English	2		2				3	63	112	175	7.00	C	UICE102, UICE202
		3	UICE302	Engineering Surveying I	المساحة الهندسية 1	English	2		3				2	77	73	150	6.00	C	
		4	UICE303	Concrete Technology	تكنولوجيا الخرسانة	English	3		2				3	78	47	125	5.00	C	
		5	UICE304	Fluid Mechanics	ميكانيك الموائع	English	2		2				3	63	62	125	5.00	C	
		6	UICE305	Probability and Statistics	الاحتمال والاحصاء	English	2						2	32	43	75	3.00	C	
						Total	12	0	11	0	0	0	15	360	390	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGII	Four	1	UICE400	Engineering Surveying II	المساحة الهندسية 2	English	2		3				3	78	72	150	6.00	C	UICE302
		2	UICE401	Mechanics of Materials II	ميكانيك المواد 2	English	3				1		2	62	88	150	6.00	C	UICE301
		3	UICE402	Hydrology and Hydraulics	الهيدرولوجي والهايدرولكس	English	2		2		1		3	78	72	150	6.00	C	UICE304
		4	UICE403	Building Construction	أنشاء المباني	English	2			1			2	47	53	100	4.00	C	
		5	UICE404	Engineering Management & Economics	الأدارة الهندسية والأقتصاد	English	2		1				3	48	52	100	4.00	C	
		6	UICE405	Engineering Mathematics	الرياضيات الهندسية	English	2				1		2	47	53	100	4.00	B	UICE203
						Total	13	0	6	1	3	0	15	360	390	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGIII	Five	1	UICE500	Structural Analysis I	التحليل الهيكلي 1	English	3				1		2	62	63	125	5.00	C	UICE301
		2	UICE501	Soil Mechanics I	ميكانيك التربة 1	English	2		2		1		2	77	73	150	6.00	C	
		3	UICE502	Numerical Methods	طرق عددية	English	2				1		2	47	53	100	4.00	B	UICE102
		4	UICE503	Building Services	خدمات الابنية	English	3						2	47	53	100	4.00	E	
		5	UICE504	Sanitary Engineering and Plumbing Design I	الهندسة الصحية والتصميم الصحي 1	English	3		1		1		2	77	48	125	5.00	C	UICE304
		6	UICE505	Reinforced Concrete Design I	تصميم الخرسانة المسلحة 1	English	2				2		2	62	88	150	6.00	C	UICE301
						Total	15	0	3	0	6	0	12	372	378	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGIII	Six	1	UICE600	Sanitary Engineering and Plumbing Design II	الهندسة الصحية والتصميم الصحي 1	English	2		2				3	63	62	125	5.00	C	UICE304
		2	UICE601	Reinforced Concrete Design II	تصميم الخرسانة المسلحة 2	English	3				1		2	62	88	150	6.00	C	
		3	UICE602	Soil Mechanics II	ميكانيك التربة 2	English	2		2		1		3	78	72	150	6.00	C	UICE501
		4	UICE603	Traffic Engineering	هندسة المرور	English	3				1		2	62	63	125	5.00	C	
		5	UICE604	Structural Analysis II	التحليل الهيكلي	English	3				1		2	62	63	125	5.00	C	
		6	UICE605	Computer Application in Civil Engineering	تطبيق حاسوبي في الهندسة المدنية	English	1		2				2	47	28	75	3.00	C	
						Total	14	0	6	0	4	0	14	374	376	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGIV	Seven	1	UICE700	Design of steel structure I	تصميم المنشآت الحديدية 1	English	3				1		2	62	63	125	5.00	C	UICE604
		2	UICE701	Reinforced Concrete Design III	تصميم الخرسانة المسلحة 3	English	3				1		2	62	63	125	5.00	C	UICE601
		3	UICE702	Foundation Engineering I	هندسة الأسس 1	English	2				2		2	62	63	125	5.00	C	UICE501
		4	UICE703	Transportation Engineering	هندسة المواصلات	English	2		2				3	63	62	125	5.00	C	UICE603
		5	UICE704	Project in Civil Eng. (1)	مشروع (1)	English	2		4				2	92	58	150	6.00	C	
		6	UICE705	CE Elective (1)	مادة أختيارية 1	English	3						2	47	53	100	4.00	E	
						Total	15	0	6	0	4	0	13	388	362	750	30.0		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGIV	Eight	1	UICE800	Design of steel structure II	تصميم المنشآت الحديدية 2	English	3				1		2	62	88	150	6.00	C	UICE700
		2	UICE801	Foundation Engineering II	هندسة الأسس 2	English	4						2	62	88	150	6.00	C	UICE702
		3	UICE802	Project in Civil Eng. (2)	مشروع (2)	English	2		4				2	92	108	200	8.00	C	UICE704
		4	UICE803	Quantity Survey	المسح الكمي	English	2		2				2	62	63	125	5.00	C	
		5	UICE804	CE Elective (2)	مادة أختيارية (2)	English	3			1			2	62	63	125	5.00	E	
						Total	14	0	6	1	1	0	10	340	410	750	30.0		
						Total	110	0	47	6	20	0	105	2850	3150	6000	240.0		Must be 240 ECTS

Note: The student should complete 4 weeks of Summer Internships to fullfil the requirements of the Bachelor's degree

Structured SWL (hr/w) type

CL	Class Lecture
Lab	Laboratory
Pr	Practical Training
Tut	Tutorial
Lect	Online lecture
Semn	Seminar

Module type

B	Basic learning activities
C	Core learning activity
S	Suport or related learning activity
E	Elective learning activity

SWL:	Student Workload
SSWL:	Structured SWL
USSWL:	Unstructured SWL

Note: Columns O, Q and R are progrmaed, protected and should not be edited

الملحق (2)
دليل البرنامج الدراسي
Program Catalog

Al-Iraqia University
الجامعة العراقية

First Cycle – Bachelor's degree (B.Eng.) – Civil engineering

بكالوريوس هندسة - الهندسة المدنية

جدول المحتوياتTable of Contents |

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

1. Mission & Vision Statement

Vision Statement

To produce engineers having professional and leadership qualities with capacity to take up professional and research assignments in Civil Engineering and allied fields with focus on inter-disciplinary and innovative approach and to compete at the global level.

Mission Statement

- Create and develop sustained environment of learning, to nurture the students into highly skillful and ethical professionals by imparting quality education with social obligations.
- To establish collaborative partnerships with academic, research and industrial entities to provide a knowledge base for existing and emerging technologies to enhance the skills innovativeness, management skills and lifelong learning in civil engineering students.
- To provide students with the principles and methodologies needed for civil engineering practice and prepare students for leadership roles in Civil Engineering.

2. Program Specification

Programme code:	BEng-CE	**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

The goal of civil engineering is to design the constructed and natural environments that people live in. The structures that sustain and enclose us are at issue. It concerns how we develop in relation to the environment, how we protect ourselves from it, and how we protect the environment from us. In addition to having a high level of expertise, civil engineers must also be creative, inclusive, open-minded, and capable of taking charge when necessary. The Civil engineering program has been developed to give graduates an adequate technical foundation in all of the major fields of the modern Civil Engineering profession by delivering a coherent, coordinated, and balanced degree program that integrates fundamental engineering science with practical application. It will allow students to build a sophisticated understanding of the context in which engineering projects are generated. It will also help students improve their oral, written, and graphic communication skills. Students will be given enough time to investigate the topic, conduct self-directed study, and consider the concerns and challenges of the content, with additional time for self-directed study gradually increasing over the four years as a better preparation for professional practice. The curriculum covers all aspects of the highly complex field of civil engineering, including structural engineering, project management for building projects, and infrastructure facilities including sewage networks, dams, highways, and bridges. It also includes sanitary and environmental engineering as well as water resources engineering. And soil methods as well as contemporary geomatics engineering and remote sensing methods, in line with the Department's research units.

3. Program Goals

1. To equip students with the knowledge of analyzing data and technical concepts pertaining to the development of infrastructure, design, sustainability, construction management and any other field related to civil engineering.
2. To perform their/duties efficiently, effectively and ethically at individual level and also at group level in a multidisciplinary team, contributing to the welfare of the society.
3. To adopt a new innovative technology by continuously updating their knowledge through lifelong learning achieving the personal and organization growth.

4. Student Learning Outcomes

Upon successful completion of this program, graduates will typically have:

Outcome 1

An ability to identify, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

Outcome 2

An ability to communicate effectively with a range of audiences.

Outcome 3

An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

Outcome 4

An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

Outcome 5

An ability to develop and conduct appropriate experimentation analyzes and interprets data, and use engineering judgment to draw conclusions.

Outcome 6

An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

Outcome 7

An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

5. Academic Staff

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6. Credits, Grading and GPA

Credits

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

Grading

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

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

Calculation of the Cumulative Grade Point Average (CGPA)

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

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

   CGPA = [(1st ^{m}odule score x ECTS) + (2nd ^{m}odule score x ECTS) + ……] / 240

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UI100	Human Rights	32	18	2.00	S	
UICE101	Engineering Mechanics I	62	113	7.00	C	
UICE102	Mathematics I	62	88	6.00	B	
UICE103	Construction Materials	64	86	6.00	C	
UICE104	Physics for Engineers	62	63	5.00	B	
UICE105	Engineering Drawing	62	38	4.00	C	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UICE200	Workshop technology	47	53	4.00	S	
UI201	English Language	32	68	4.00	S	
UICE202	Engineering Mechanics II	62	88	6.00	C	UICE101
UICE203	Mathematics II	62	88	6.00	S	UICE102
UICE204	Engineering Geology	47	78	5.00	B	
UICE205	Computer Aided Graphics	62	63	5.00	C	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UICE300	Computer Programming	47	53	4.00	S	
UICE301	Mechanics of Materials I	63	112	7.00	C	UICE102, UICE202
UICE302	Engineering Surveying, I	77	73	6.00	C	
UICE303	Concrete Technology	78	47	5.00	C	
UICE304	Fluid Mechanics	63	62	5.00	C	
UICE305	Probability and Statistics	32	43	3.00	C	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UICE400	Engineering Surveying II	78	72	6.00	C	UICE302
UICE401	Mechanics of Materials II	62	88	6.00	C	UICE301
UICE402	Hydrology and Hydraulics	78	72	6.00	C	UICE304
UICE403	Building Construction	47	53	4.00	C	
UICE404	Engineering Management & Economics	48	52	4.00	C	
UICE405	Engineering Mathematics	47	53	4.00	B	UICE203

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UICE500	Structural Analysis I	62	63	5.00	C	UICE301
UICE501	Soil Mechanics I	77	73	6.00	C	
UICE502	Numerical Methods	47	53	4.00	B	UICE102
UICE503	Building Services	47	53	4.00	C	
UICE504	Sanitary Engineering and Plumbing Design I	77	48	5.00	C	UICE304
UICE505	Reinforced Concrete Design I	62	88	6.00	C	UICE301

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UICE600	Sanitary Engineering and Plumbing Design II	63	62	5.00	C	UICE304
UICE601	Reinforced Concrete Design II	62	88	6.00	C	UICE505
UICE602	Soil Mechanics II	78	72	6.00	C	UICE501
UICE603	Traffic Engineering	62	63	5.00	C	
UICE604	Structural Analysis II	62	63	5.00	C	UICE500
UICE605	Computer Application in Civil Engineering	47	28	3.00	C	

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UICE700	Design of steel structure I	62	63	5.00	C	UICE604
UICE701	Reinforced Concrete Design III	62	63	5.00	C	UICE601
UICE702	Foundation Engineering I	62	63	5.00	C	UICE501
UICE703	Transportation Engineering	63	62	5.00	C	UICE603
UICE704	Project in Civil Eng. (1)	92	58	6.00	C	
UICE705	CE Elective (1)	47	53	4.00	E	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UICE800	Design of steel structure II	62	88	6.00	C	UICE700
UICE801	Foundation Engineering II	62	88	6.00	C	UICE702
UICE802	Project in Civil Eng. (2)	92	108	8.00	C	UICE704
UICE803	Quantity Survey	62	63	5.00	C	
UICE804	CE Elective (2)	62	63	5.00	E	

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الملحق (3)
دليل المواد الدراسية
Modules Catalog

Al-Iraqia University
الجامعة العراقية

First Cycle – Bachelor's Degree (B.Eng.) -Civil Engineering

بكالوريوس هندسة - هندسة مدنية

Table of Contents

1. Overview
2. Undergraduate Modules 2023-2024
3. Contact

1. Overview

This catalogue is about the courses (modules) given by the program of Civil Engineering to gain the Bachelor of Science degree. The program delivers (50) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظره عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج الهندسة المدنية للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (٥١) مادة دراسية، على سبيل المثال، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
UI100	Human Rights	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	-	32	18
Description			
The course provides an introduction to basic human rights philosophy, principles, instruments and institutions, and also an overview of current issues and debates in the field with focus on the problems specific to Iraq. This course aims to explore some aspects of the diverse and increasingly complex body of international law of human rights that has both national and international application. The course also seeks to analyze the ways in which allegations of human rights violations are dealt with in the Iraqi courts and the impact of human rights discourse on international politics and relations.			

Module 2

Code	Course/Module Title	ECTS	Semester
UICE101	Engineering Mechanics I	7	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	62	113
Description			
The main objective of a first course in mechanics should be to develop in the engineering student the ability to analyze any problem in a simple and logical manner and to apply to its solution a few, well-understood, basic principles. Analyze forces and find out the resultant forces in two and three dimensions. Differentiate between various type of supports and draw free-body-diagram, Compute the reaction force in simple structure (beam, frame, truss), Study Mechanism and laws of friction.as well as Equations of equilibrium, Equilibrium of a rigid body plane, solving equation of equilibrium plane, Equations of equilibrium, Equilibrium of a rigid body space, Solving problem of equilibrium space.			

Module 3

Code	Course/Module Title	ECTS	Semester
UICE102	Mathematics I	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	62	88
Description			
Mathematics is a broad field that encompasses various branches and concepts such as Functions: Functions are commonly represented as equations, graphs, or tables and are fundamental in describing relationships between variables. Derivatives: The derivative provides important information about the behavior of a function. Integration: Integration is the process of finding the area under a curve or calculating the accumulated sum of infinitesimally small quantities. Matrices: They are used to represent and manipulate data in various mathematical Operations, Determinants: They provide important information about the properties of matrices. Mathematics provides engineers with a powerful toolbox of analytical and problem-solving skills, enabling them to design, analyze, and optimize systems, predict behaviors, and make informed decisions. It forms the backbone of engineering principles and helps engineers tackle complex challenges across various engineering disciplines.			

Module 4

Code	Course/Module Title	ECTS	Semester
UICE103	Construction Materials	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	64	86
Description			
The construction materials course provides students with a comprehensive understanding of the fundamental properties, selection criteria, and applications of materials used in the construction industry. The syllabus focuses on key topics essential for a solid foundation in this field. The course begins with an introduction to the classification and characteristics of construction materials, including cementitious materials, masonry materials, metals and alloys, wood and timber products, asphalt and bituminous materials, plastics and composite materials, sustainable and innovative construction materials, material selection and specifications. Students will learn about the physical and mechanical properties, as well as the manufacturing processes and quality control methods associated with each material. Overall, this course equips students with the knowledge and skills necessary for effective material selection, assessment, and utilization in construction projects.			

Module 5

Code	Course/Module Title	ECTS	Semester
UICE104	Physics for Engineers	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	62	63
Description			
Physics is an essential subject for engineers of civil engineering as it provides the fundamental understanding of the physical principles that govern the behavior of structures, materials, and systems. Engineers can accurately design and test civil structures, ensuring that they are safe, efficient, and meet regulatory requirements. The course covers topics such as force, motion, thermodynamics, elasticity, and stress play a crucial role in designing and analyzing structures. These topics are essential for understanding the behavior of materials and structures, the forces that act upon them, and the various environmental factors that affect their performance. Engineering Physics also involves the use of experimental and computational techniques to design, test, and optimize civil engineering structures. Therefore, understanding the basics of physics is crucial for every civil engineer, enabling them to design structures that are safe, durable, and sustainable.			

Module 6

Code	Course/Module Title	ECTS	Semester
UICE105	Engineering Drawing	4	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	3	62	38
Description			
The engineering drawing class provides students with a comprehensive understanding of principles and techniques essential for creating and interpreting technical drawings. Students learn the standards and conventions of engineering drawing, develop skills in using traditional drafting tools and computer-aided design (CAD) software, and gain proficiency in generating accurate and precise drawings. The class covers topics such as orthographic projections, isometric projections, and dimensioning. Through a combination of lectures, practical exercises, and projects, students enhance their spatial visualization abilities, improve their communication of design requirements, and develop the skills necessary for the drafting.			

Module 7

Code	Course/Module Title	ECTS	Semester
UICE200	Workshop technology	4	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	2	47	53
Description			
Preparing applied engineers in the field of engineering sciences who are distinguished by a high level of knowledge and technological creativity, in line with the strict standards adopted globally in quality assurance and academic accreditation of the corresponding engineering programs, while adhering to the ethics of the engineering profession. Enable the student to know and understand work systems, risks, and the factors surrounding them. Also, apply detailed understanding in proposal development and writing; use innovative knowledge in sourcing, analysing and presenting data; and apply research methodologies to undertake independent investigation and academic writing of a specialized topic.			

Module 8

Code	Course/Module Title	ECTS	Semester
UICE200	English Language	4	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	1	32	68
Description			
This module provides a comprehensive overview of key aspects of the English language relevant to civil engineering field. It focuses on English grammar basics, covering essential topics, it delves into technical English vocabulary and terminology related to civil engineering field, introducing technical collocations, compound words, idiomatic expressions, and industry-specific terms in the context of construction, structural engineering, geotechnical engineering, transportation engineering, and sanitary engineering. This module is designed to enhance student's general language skills, focusing on reading and writing. students will be exposed to the concept of lifelong learning, emphasizing the importance of utilizing online resources, industry publications, and professional development platforms to stay current in the field of civil engineering. By the end of the module, students will possess effective communication skills, a broad technical vocabulary, advanced reading comprehension abilities, proficient technical writing skills, and a commitment to continuous learning.			

Module 9

Code	Course/Module Title	ECTS	Semester
UICE202	Engineering Mechanics II	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	72	53
Description			
This module studies the description of dynamics which is the branch of mechanics which deal with the motion of bodies under the action of forces. Obtain and centroid for deferent engineering shapes. Obtain moment of inertia for deferent engineering shapes. Understand the engineering applications that evolve dynamics. Solve engineering problems involving objects moving along a linear path , Simplify engineering problems involving objects moving along a curved path, Recognize and deal with projectile problems, Write the equation of motion of a moving object, Solve problems involving the force in accelerated bodies, Apply the theorem of conservation of energy to solve kinetic problems.			

Module 10

Code	Course/Module Title	ECTS	Semester
UICE203	Mathematics II	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	62	88
Description			
Mathematics encompasses a wide range of concepts and topics include: Methods of Integration; Integration is the process of finding the accumulated sum or the area under a curve. Multivariable Functions and Partial Derivatives: In many real-world situations, functions depend on multiple variables. It provides information about how a function varies in different directions. Differential Equations: A differential equation is an equation that relates a function to its derivatives. It describes the relationship between a function and its rate of change. Solving differential equations involves finding functions that satisfy the given equation, and this process often requires advanced mathematical techniques and methods. Integration, multivariable functions and partial derivatives, and differential equations are essential tools for engineers. They provide the mathematical framework for analyzing complex systems, optimizing designs, modeling dynamic behavior, controlling systems, and solving engineering problems across a wide range of disciplines.			

Module 11

Code	Course/Module Title	ECTS	Semester
UICE204	Engineering Geology	5	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	47	78
Description			
This module provides students with a comprehensive understanding of the principles and applications of engineering geology in civil engineering projects. It focuses on the study of minerals and rocks, physical and mechanical properties of soils, mineral composition, crystallography, and the formation of sedimentary and metamorphic rocks. Students also examine the physical and engineering properties of rocks and soils of Iraq. Structural geology is another key component, encompassing earth movements, erosion of rocks, mechanical behavior of soils and rocks under various loading conditions, and the influence of groundwater. By the end of the module, students will be equipped with the knowledge and skills to identify soils, classify them according to the USCS, and analyze the physical and engineering properties of rocks and soils. They will understand the mechanical behavior of soils and rocks under diverse loading conditions, and apply this knowledge to design foundations, slopes, and retaining structures. Additionally, they possess the ability to interpret topographic and geological maps.			

Module 12

Code	Course/Module Title	ECTS	Semester
UICE205	Computer Aided Graphics	5	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	3	62	63
Description			
Computer Aided Graphics It means The art of creating images with the help of a computer. The material is considered one of the programs that fall within the concept of computer-aided design (CAD), which will help the student in drawing speed and accuracy.so, let students have a clearly understand all the engineering properties of an entity or product. This course helps in the use of computer systems and software to contribute to the creation, modification, analysis or improvement of engineering designs. Computer design software is used to increase student productivity, improve design quality, improve communication through documentation, and create manufacturing databases. The outputs of computer design for the student are usually in the form of electronic files that can be printed, manufactured, or for other processes within the field of manufacturing or study. At the end of the semester, the student will be able to master the AutoCAD and Revit engineering programs.			

Module 13

Code	Course/Module Title	ECTS	Semester
UICE300	Computer Programming	4	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	2	47	53
Description			
It involves using programming languages to communicate with computers and create software application. Such as learn about the basic components of a computer system, levels of Programming Languages, Including MATLAB: widely used in scientific and engineering fields for data analysis, visualization, and algorithm development. Conditional Statements and Loops: learn how to use these control structures to create efficient and flexible programs. Writing Programs to Solve Complex Problems: explore different techniques and strategies for problem-solving and practice applying them to real-world scenarios. Creating 2D and 3D Plots: learn how to create 2D plots, customize their appearance by adding labels, titles, and legends. Computer programming is vital for engineers as it enhances problem-solving abilities, automates tasks, enables data analysis and visualization, facilitates simulation and modeling, supports prototyping and development, empowers control systems and automation, promotes interdisciplinary collaboration, and fosters innovation and research.			

Module 14

Code	Course/Module Title	ECTS	Semester
UICE301	Mechanics of Materials I	7	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	112
Description			
This course is considered one of the core subjects that the civil engineer must be familiar with its fundamentals to analyze and design solid bodies. The course outlines the concept of stress and strain, which enable the civil engineering student to calculate and design the size of structure members subjected to any type of loadings, without any failure or excessive deformation in the solid body. The mechanical properties are also introduced in this course and learn the relation between the stress and strain, and leads to the Hook's low, and Poisson's ratio. The course enables the students to calculate the axial deformation, and solve the indeterminate structures using the deformation formula, and study the effects of thermal stresses. The shear-moment diagram is presented in this module to locate and calculate the maximum shear and moment values along the slender beams and use the flexural and shear formulas to calculate the bending and shear stresses.			

Module 15

Code	Course/Module Title	ECTS	Semester
UICE302	Engineering Surveying I	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	77	73
Description			
Engineering surveying as those activities involved in the planning and execution of surveying for the planning, design, construction, operation, and maintenance of engineered projects. Is a course that Giving the students fundamental concepts about surveying as science in general then teaching them the concepts of engineering surveying. Explain about Errors, mistakes and most probable value. Teaching them how to measure distances using simple instruments then modern ones and how to correct the measurements to get the desired accuracy, how to calculate the scale, and find the distance on a map or on the ground, explain obstacle in chaining, provides student with a comprehensive and understanding what elevations are and how to measure them and the importance of different types of levels, correcting elevations, sections both longitudinal and cross sections, to teach them about elevations and benchmarks, using level instrument, explain what benchmarks are and how to make them using different types of levels. This is the basic subject for all engineering surveying I.			

Module 16

Code	Course/Module Title	ECTS	Semester
UICE303	Concrete Technology	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	78	47
Description			
The Module is intended to help undergraduate and Civil Engineers to understand the theoretical and practical aspects of concrete technology. It includes the latest specifications and regulations of American and Iraqi Standards (ASTM, ACI and IQS) for concrete construction and mix design. The Module includes 5 units that provide an introduction to concrete structures, the properties and requirements of constituents of concrete, including the role of various admixtures to get special properties. The properties of fresh concrete and hardened concrete and the method of testing them is explained in detail. Concreting in hot weather, quality control.			

Module 17

Code	Course/Module Title	ECTS	Semester
UICE304	Fluid Mechanics	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			
The importance of understanding the mechanics of fluids is apparent from when we turn on our kitchen faucets, thus activating flow through a network of pipes and valves, to when we drive our cars, which rest on pneumatic tires, have hydraulic shock absorbers, and pump gasoline through a complex piping system. In fact, our very existence depends on fundamental principles of fluid mechanics – the flow of blood through our bodies. A number of environmental, geotechnical and structural engineering problems are intimately linked to fluid mechanics as well. Consider, for example, the synergy of fluid principles in air pollution control, water and wastewater treatment, groundwater management and control, and the construction of dams and bridges. As a result, it is vital that civil engineers develop a basic foundation in the mechanics of fluids before investigating these and other similar problems.			

Module 18

Code	Course/Module Title	ECTS	Semester
UICE305	Probability and Statistics	3	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	-	32	43
Description			
The main objective of statistics is prediction, This makes it imperative for a civil engineer to know the future expectations of the engineering phenomena that occur and use them in his daily life in a large way, For example, the change in the strength of construction materials such as iron, concrete, brick and stone, the ability of the soil to bear the loads, the amount and speed of water flow in rivers and irrigation canals, as well as the study of traffic problems on roads Internal and external, in addition to traffic accidents and other known and important matters for every civil engineer.			

Module 19

Code	Course/Module Title	ECTS	Semester
UICE400	Engineering Surveying II	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			
The course aims to provide the students with necessary fundamental concepts about surveying as science in general then teaching them the concepts of engineering surveying. Teach them direction, azimuth bearing, and magnetic declination. And explain how to measure the horizontal and vertical angles and how to compute the unknown elevations and height of building, students learn to calculate all kinds of areas by different methods, and explain what the coordinate and traversing using theodolite instrument. provides student with a comprehensive and understanding about the topographic map and contour line and how to use topographic maps and draw contour lines. Students learn about GPS and EDM applications to determine apposition and knowledge about how satellites position objects on and above surface of the earth. And explain about GIS application to record information on the map, and analyze spatial data using GIS, and analyze toots to record information on the map.			

Module 20

Code	Course/Module Title	ECTS	Semester
UICE401	Mechanics of Materials II	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	62	88
Description			
The fundamentals learned in the first course is used to extend the study in the mechanics of the materials to learn the effects of torsion loadings, and the shear stresses developed internally. All the type of loadings are combined and the response is taken simultaneously to calculate the normal stresses. The stresses and strains that are associated with local axis in previous course are now transformed to new set of axes with different orientation.The course discusses various methods for determining the deflection and slope at specific points on beams and shafts. By completing the two courses of Mechanics of Materials the students will be able to go further in designing various types of structures such as reinforced concrete, steel, or timber. Taking into account the effects of all kinds of loadings and associated failures and deformations.			

Module 21

Code	Course/Module Title	ECTS	Semester
UICE402	Hydrology and Hydraulics	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			
This course is designed to learn the analysis of the flow and pressure distribution of flowing water for many fundamental engineering tasks, such as sizing pipes between tanks and taps, picking pumps, and assuring a good flow distribution in waterworks. The students will be guided to learn how to solve such problems and how to think practically about the flow of water in engineered systems. The course will cover both pressurized and open-channel flow and the hydraulics of pipes, networks, channels, culverts, and spillways. Also, the course will include an Introduction to the stream flow Hydrograph and the calculation of the runoff of a site The course is taught through a mix of three approaches: Classroom lectures to present the basic theory, problem-solving sessions where students put the theory to work in solving practical problems, and laboratory sessions where students will test the theory against their real hydraulic system observations.			

Module 22

Code	Course/Module Title	ECTS	Semester
UICE403	Building Construction	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	47	53
Description			
This module contains 4 units on various aspects of Building Construction. It is prepared with the objective to provide technical details on 'Formwork for Buildings' for the guidance of civil engineering students involved in planning, designing, construction and maintenance of buildings & other structures. It covers the functional requirements, design aspects, formwork construction and its safe removal, safety measures and Study implementation mechanisms and supervision of the construction phases of the structural (primary) and various which include (foundations, walls, floors, stairs and others. Knowledge of different materials to build and understand the composition of the Executive and requirements. The aim of this Module is to acquaint Civil Engineers, civil engineering students, Builders and Contractors etc. with basic principles for construction of buildings.			

Module 23

Code	Course/Module Title	ECTS	Semester
UICE404	Engineering Management & Economics	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	52
Description			
The Program Specification provides a concise summary of the main features of the program and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. The module type of program is core and the ECTC Credits are 4. The aim is preparing building and project management engineering students to work on the management of professional engineering practice. The weekly syllabus includes details of Construction Management principles and planning techniques, critical path methods and project scheduling in addition to linear programing and statistical quality control. The outcomes present knowledge of (project management, money management, financial planning, economic optimization) and knowledge of comparing an alternative of benefits and cost Project scheduling.			

Module 24

Code	Course/Module Title	ECTS	Semester
UICE405	Engineering Mathematics	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	52
Description			
Engineering mathematics is an essential tool for engineers as it enables them to model, analyze, design, optimize, and innovate in various engineering disciplines. This module carried out on ordinary Differential Equations (ODEs) are mathematical equations that involve an unknown function and its derivatives (Second Order Differential Equations, Higher Order Differential Equations). Also, applications of Second and Higher-Order ODEs: (Undamped Vibration of a Beam, Buckling of Slender Columns). And System of Differential Equations: (Undamped Vibration of a Cabled System, Multi-Degree of Freedom System), Fourier series: Is a mathematical technique used to represent periodic functions as an infinite sum of sine and cosine functions (or complex exponentials).Also, application in Mechanical Vibration: (Partial Differential Equations and Boundary Value Problems, One-Dimensional Wave Equation, Torsion Vibration of a Circular Shaft, Two-Dimensional Wave Equation, Three-Dimensional Heat Equation).Moreover, Power Series Solutions of Differential Equations: Provide a way to approximate the solutions.			

Module 25

Code	Course/Module Title	ECTS	Semester
UICE500	Structural Analysis I	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	62	63
Description			
Structural Analysis I is an essential course in engineering disciplines, specifically for those pursuing careers in civil and structural engineering. This course provides the foundation for understanding how various structures respond to different loads. Students learn essential techniques such as the method of joints and sections, which are used for computing internal forces and moments in simple structures. This knowledge is not just theoretical; it has real-world applications, helping engineers design and analyze everyday structures like buildings, bridges, and tunnels. The course also promotes problem-solving skills, requiring students to apply the principles of statics and mechanics of materials to solve complex structural problems. Safety considerations are a key component of the course, providing students with the knowledge needed to design structures that can safely bear different loads. Some courses may also introduce students to industry-standard software tools used in structural analysis, giving students early exposure to tools they will use in their careers. In summary, Structural Analysis I is a pivotal course that introduces fundamental concepts and techniques in structural engineering, promoting a deep understanding of structural behavior, problem-solving skills, and a focus on safety.			

Module 26

Code	Course/Module Title	ECTS	Semester
UICE501	Soil Mechanics I	6	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	77	73
Description			
The essential physical and analytical understanding of soil mechanics is important to function for civil engineer. Student completing this course will has background to higher level courses involving soil mechanics, seepage and soil testing. At the end of the class, the student will be able understand and define the basic soil properties; especially particle-size, density and specific gravity. Also understanding the weight-volume relations defining the soil properties, and be familiar with engineering soil classification systems such as unified soil classification system used by civil engineers and AASHTO classification system which is used in the roads design. Understand the concept of soil compaction and factors affecting compaction which help civil engineer to evaluate the compaction works in the field. Also, learning about field and laboratory measurement of density and compaction techniques used in large projects.			

Module 27

Code	Course/Module Title	ECTS	Semester
UICE502	Numerical Methods	4	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	47	53
Description			
Numerical methods are indispensable to engineers as they provide tools for solving complex problems. They are essential for tackling real-world engineering challenges and enabling accurate and efficient engineering analysis and design.it carried out on: Modified Euler Method: Is a numerical method used to approximate the solutions of ordinary differential equations (ODEs), Gaussian Elimination Method: It involves systematically performing row operations to transform the system into an equivalent triangular system, Gauss-Jordan Elimination Method: This method allows for the direct extraction of solutions, making it useful for solving linear systems and finding matrix inverses, Jacobi Method: Is often used for large systems and parallel computing, (Gauss-Seidel, Runge-Kutta, Newton-Raphson) Methods are the iterative techniques for solving systems. Laplace Convolution Theorem: This theorem is particularly useful for solving linear differential equations and analyzing systems. Trapezoidal Rule and Simpson's Rule: These are numerical integration techniques used to approximate the definite integral of a function.			

Module 28

Code	Course/Module Title	ECTS	Semester
UICE503	Building Services	4	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	47	53
Description			
Building services is interested with the built environment aspects that assure wellbeing of people that use the buildings through providing all ways of services. These services that should be involved are ventilations, air conditioners, electrical powers and lights, fire extinguisher and safety engineering, thermal and acoustic insulation, transportations and routine evaluation of buildings. These should serve the buildings that could be private, popular building for example: houses, schools, governmental offices, hospitals, traditional such as malls, supermarkets….etc. the maintenance and management these services could ensure the lifespans of these buildings over lifecycles. Therefore, the building service module enrich the students with the knowledge and skills related to buildings services. Through the acquired knowledge, the student will be able to develop the techniques and solve engineering problems that related to the building services.			

Module 29

Code	Course/Module Title	ECTS	Semester
UICE504	Sanitary Engineering and Plumbing Design I	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	77	48
Description			
Water treatment is a vital process that ensures the availability of clean, safe, and potable water for human consumption and various industrial applications. It involves the removal of contaminants, such as bacteria, viruses, chemicals, and impurities from water sources, including rivers, lakes, and groundwater. The treatment process typically includes several steps, including coagulation, flocculation, sedimentation, filtration, disinfection, and sometimes desalination. Coagulation involves the addition of chemicals to water, causing impurities to clump together. Flocculation helps the formation of larger particles, which settle during sedimentation. Filtration removes remaining suspended particles through various media layers. Disinfection kills or inactivates disease-causing microorganisms, typically achieved through chlorination, ultraviolet light, or ozone treatment. Desalination is utilized in areas with limited freshwater resources, where salt is removed from seawater or brackish water.			

Module 30

Code	Course/Module Title	ECTS	Semester
UICE505	Reinforced Concrete Design I	6	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	62	88
Description			
This is a core course which will provide an understanding and ability to analyze and design reinforced concrete structural elements. Among the topics discussed are objective and methods of design, code of practice, analysis and design of sections for moments and shear, checking for deflection and cracking, durability and detailing requirements, design of simply supported and continuous beams, design of one way restrained and simply supported slab. Furthermore, the students will be exposed to the concept of rectangular concrete sections which covers topics on principle and methods of design and analyzing. Moreover, serviceability and cracking control.			

Module 31

Code	Course/Module Title	ECTS	Semester
UICE600	Sanitary Engineering and Plumbing Design II	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	77
Description			
Wastewater engineering is a vital field focused on managing and treating wastewater to protect public health and the environment. It involves designing and implementing systems to collect, transport, and treat wastewater, ensuring its safe disposal or reuse. Wastewater engineers employ various technologies such as sewage treatment plants, filtration systems, and biological processes to remove pollutants and contaminants from wastewater before it is released back into the environment. On the other hand, plumbing engineering plays a crucial role in designing efficient and reliable plumbing systems for buildings and infrastructure. Plumbing engineers work to ensure the safe and effective distribution of water, as well as the proper disposal of wastewater. They consider factors such as water supply, piping networks, fixture selection, and drainage systems, while adhering to building codes and regulations.			

Module 32

Code	Course/Module Title	ECTS	Semester
UICE601	Reinforced Concrete Design II	6	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	62	88
Description			
The aim of this course is to provide students with a thorough understanding of the design of reinforced concrete structures. Topics covered will include: design of beams and slabs for flexure and shear; detailing of flexural and shear reinforcement; behavior of reinforced concrete members under combined flexure and axial load; Design of an Edge Supported Two-way Solid Slab Including Analysis and Design of Supporting Continuous Beams; Analysis of a Column with Compression Load Plus Uniaxial Moment as well as Analysis and Design for Torsion, and fulfill the ACI code requirements to design of shear and torsional members. Also, ACI Analysis Procedure for a Short Column under an Axial Load (Small Eccentricity) is covered.			

Module 33

Code	Course/Module Title	ECTS	Semester
UICE602	Soil Mechanics II	6	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			
Understanding of the basic concepts of soil mechanics is essential in the design of foundations for structures, retaining walls, tunnels, excavations, earth fills, stability of earth slopes, sanitary landfill, and environmental remediation projects. Specifically, a student completing this course will understanding the basic principles of soil mechanics and geotechnical engineering, and also learn the relevant terms of soil tests needed to describe and predict the behavior of a soil, permitting the student to work effectively with the specialist in engineering geotechnical. Also, the student will be able to solve fundamentals problems related to the flow of pore water, compression and consolidation, and shear strength of soil as required in geotechnical design.			

Module 34

Code	Course/Module Title	ECTS	Semester
UICE603	Traffic Engineering	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	62	63
Description			
The course aims to provide students with a comprehensive understanding of traffic flow principles, traffic characteristic measurements, and their interpretation for infrastructure changes or development. It also focuses on the design of traffic signal timing, including urban traffic control, through numerous worked examples. The module aims to evaluate the importance of road safety and driver behavior in accident prevention. It promotes interdisciplinary approaches to solving engineering problems and emphasizes the need for collaboration with other disciplines in formulating policies to address urban traffic congestion. The learning outcomes of the course include understanding the design of traffic signal timing programs, performing necessary traffic studies for infrastructure changes, exposing students to interdisciplinary problem-solving approaches, conceptualizing driver behavior for engineering solutions, appreciating input from other disciplines in formulating congestion solutions, and engaging in discussions and debates on urban congestion solutions.			

Module 35

Code	Course/Module Title	ECTS	Semester
UICE604	Structural Analysis II	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	62	63
Description			
Structural Analysis II is a pivotal course in engineering curricula, extending the foundational knowledge gained from Structural Analysis I. This course introduces advanced techniques for analyzing indeterminate and complex structures, and considers a variety of loading conditions, enhancing problem-solving and critical thinking skills. It often includes learning advanced software tools, vital for modern engineering professions. Furthermore, it acts as a springboard into specialized fields such as seismic design or structural dynamics and provides essential preparation for subsequent design courses. In essence, Structural Analysis II deepens the understanding of how different forces interact within structures, critical for predicting a structure's behavior and ensuring its safety and reliability. This course is key for any aspiring civil or structural engineer.			

Module 36

Code	Course/Module Title	ECTS	Semester
UICE605	Computer Application in Civil Engineering	3	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	2	47	28
Description			
Modern structural engineers are expected to design structures that are not only safe and stable, but also it is required to consume the time. Therefore, this module is concerned with the analysis and design of steel, reinforced concrete and composite construction, focusing on multi-storey buildings using ETABS and SAFE software. In this module, students develop the skills to evaluate the structural design process from the brief to the construction stage, including essential aspects related to structural integrity, constructability and health and safety. To effectively work with design codes, engineers must understand the underpinning fundamentals of structural design to available codes, including global and member stability, analysis and design methods. Fundamental concepts related to the performance-based design of structures.			

Module 37

Code	Course/Module Title	ECTS	Semester
UICE700	Design of steel structure I	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	62	63
Description			
Steel design module is concerned to provide students with knowledge and skills related to steel structures analysis and design. Understanding the behavior of steel structure fundamental principles considers a crucial to know the problems and engineering solutions. This course studies the analysis and design of steel structure and the main problems that could occur in steel structures. Moreover, the design criteria and standard also will be known. In addition to that, mechanical properties of steel structure, design of actions and all steel members in tension, compression, shear, torsion, flexure and combined with all types of connections between members. At the end of this course, students will be able Demonstrate the Engineering principles in steel structure design, apply the engineering principles to realistic cases, demonstrate the Engineering principles in steel structure design, apply the engineering principles to realistic cases, Explicate the results of the design, design of Steel Structural Members, solve engineering problems that related to steel structures, consider Health and Safety Aspects to the steel structures design			

Module 38

Code	Course/Module Title	ECTS	Semester
UICE701	Reinforced Concrete Design III	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	62	63
Description			
Reinforced concrete Design is an introductory course in civil engineering. In this course, basic elements governed by bending, shear, axial forces or combination of them are identified and are considered as slender columns and slabs. Different methods of design will be briefly described before introducing the limit states of collapse and serviceability. As the result, the student will be able to apply design method, codes, specification and standard that govern the structural design of reinforced concrete members.as well as design and detail of main structural members in concrete buildings and satisfy the strength and serviceability. Also, Demonstrate the framing structure to ensure that complete load path exist for all loads and forces and their combination.			

Module 39

Code	Course/Module Title	ECTS	Semester
UICE702	Foundation Engineering I	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	62	63
Description			
This course on Foundation Engineering provides the students necessary geotechnical engineering skills to learn how to utilize their knowledge in soil mechanics to perform various types of engineering calculations. This includes consolidation analysis for foundations and stability analysis of slopes and retaining walls. Student completing this course will has background to higher level courses involving site exploration and soil investigation. Also, learns design of the shallow foundations under different loading and soil conditions by considering bearing pressure, bearing capacity and settlement criteria. Also, ability to calculate the lateral loads acting on an earth retaining structure by using lateral earth pressure theories. Finally, in this course the student will discuss and evaluate the feasibility of foundation solutions to different types of soil conditions considering the time effect on soil behavior.			

Module 40

Code	Course/Module Title	ECTS	Semester
UICE703	Transportation Engineering	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	62	63
Description			
The module aims to provide students with the necessary knowledge and skills to analyze, design, and construct road pavements. It focuses on several key objectives, including the analysis of road pavement structures, differentiation between different types of materials used, the design of road pavements based on design concepts and performance criteria, and the principles of geometric design. The learning outcomes of the module include the ability to select appropriate materials for different road layers, evaluate the quality and performance of road materials, perform road pavement design and analysis, develop road monitoring and maintenance programs, interpret geometric design fundamentals for safety and driver comfort, and design a road alignment. The module covers various topics such as transportation engineering introduction, unbound flexible pavement materials, bitumen properties and testing, different types of bituminous materials, flexible pavement design principles and examples, rigid pavements, and geometric design fundamentals.			

Module 41

Code	Course/Module Title	ECTS	Semester
UICE704	Project in Civil Eng. (1)	6	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	4	92	58
Description			
This course is concerned with acquiring knowledge in planning, preparing, analysis, designing, communication and implementation of different aspects of different fields of research studies. The special skills will be acquired from the research whether this research is laboratory work or practical field work or a desk-based study. The research study could be novel or executed ideas with developing these ideas. At the end of this course, students will be able to select the proper research area with either problem cases or innovative ideas. Moreover, creative a plan to achieve the project, determination of type of methods analysis of data collection, Relate the acquired information with the previous acquired knowledge obtained from their study and based on area of the study.			

Module 42

Code	Course/Module Title	ECTS	Semester
UICE704	Project in Civil Eng. (1)	6	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	4	92	58
Description			
This course is concerned with acquiring knowledge in planning, preparing, analysis, designing, communication and implementation of different aspects of different fields of research studies. The special skills will be acquired from the research whether this research is laboratory work or practical field work or a desk-based study. The research study could be novel or executed ideas with developing these ideas. At the end of this course, students will be able to select the proper research area with either problem cases or innovative ideas. Moreover, creative a plan to achieve the project, determination of type of methods analysis of data collection, Relate the acquired information with the previous acquired knowledge obtained from their study and based on area of the study.			

Module 43

Code	Course/Module Title	ECTS	Semester
UICE705	Sustainable Building	4	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	47	53
Description			
This module explores sustainability principles and their practical application in the construction industry. Topics include sustainable development, environmental impacts (resources, waste, energy, climate change), social impacts (Corporate Social Responsibility, responsible sourcing, poverty reduction), and assessment methods (indicators, life-cycle assessment, cost analysis). Through lectures, case studies, and discussions, students develop a comprehensive understanding of sustainability and its relevance to construction industry. They learn to evaluate sustainability performance and make informed decisions. This module equips students with the knowledge and skills to contribute to sustainable development and apply sustainable practices in transport infrastructure engineering and construction.			

Module 44

Code	Course/Module Title	ECTS	Semester
UICE705	Remote Sensing and GIS	4	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	47	53
Description			
The Remote Sensing and GIS module offers a comprehensive understanding of remote sensing principles and GIS software tools, preparing students for a wide range of applications after graduation. During the module, students will learn how to analyze spatial data, use cartography techniques to communicate results in maps, and collaborate with peers in GIS and GIS-dependent fields. In the final Capstone Project, they will create a professional-quality GIS portfolio piece using a combination of data identification and collection, analytical map development, and spatial analysis techniques. By the end of the module, students will be equipped with skills in data analysis, image processing, spatial data management, and problem-solving using GIS. With this knowledge, graduates are well-prepared to excel in various fields, including urban planning, infrastructure construction, and projects planning, where GIS plays a vital role in decision-making and analysis.			

Module 45

Code	Course/Module Title	ECTS	Semester
UICE800	Structural Steel Design II	6	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	62	88
Description			
Steel design module is concerned to provide students with knowledge and skills related to steel structures analysis and design. Understanding the behavior of steel structure fundamental principles considers a crucial to know the problems and engineering solutions. This course studies the analysis and design of steel structure and the main problems that could occur in steel structures. Moreover, the design criteria and standard also will be known. In addition to that, mechanical properties of steel structure, design of actions and all steel members in tension, compression, shear, torsion, flexure and combined with all types of connections between members. At the end of this course, students will be able Demonstrate the Engineering principles in steel structure design, apply the engineering principles to realistic cases, demonstrate the Engineering principles in steel structure design, apply the engineering principles to realistic cases, Explicate the results of the design, design of Steel Structural Members, solve engineering problems that related to steel structures, consider Health and Safety Aspects to the steel structures design			

Module 46

Code	Course/Module Title	ECTS	Semester
UICE801	Foundation Engineering II	6	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	62	88
Description			
This course on Foundation Engineering provides the students an ability to identify geotechnical hazards and assess the risk of them occurring and to produce engineering solutions to foundation problems. In this course provide students with exposure to the systematic methods for designing foundations and build the necessary theoretical background for design and construction of foundation systems. This includes consolidation analysis for foundations, and stability analysis of slopes and retaining walls. Also, design and analysis of deep foundations and evaluate pile capacity in the field and identify major deep foundation types and calculate skin and tip capacity of piles in clay and sand. Also studying piles material types for various applications. Finally, this course will enable engineers to make the appropriate decision and determine the type of foundation required for buildings, as well as identifying site problems and find appropriate solutions for them.			

Module 47

Code	Course/Module Title	ECTS	Semester
UICE802	Project in Civil Eng. (2)	8	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	4	92	108
Description			
This course is concerned with acquiring knowledge in planning, preparing, analysis, designing, communication and implementation of different aspects of different fields of research studies. The special skills will be acquired from the research whether this research is laboratory work or practical field work or a desk-based study. The research study could be novel or executed ideas with developing these ideas. At the end of this course, students will be able to relate theoretical aspect with practical aspect and with literatures, implement the evaluating methods, to manage and implement the plan of the research project, to analyze and explain the collected data, interpret the research data, solve engineering problem cases, and summarize findings in the reasonable way.			

Module 48

Code	Course/Module Title	ECTS	Semester
UICE803	Quantity Survey	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	62	63
Description			
This Program provides a summary of the main features of the program and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. The module type of program is core and the ECTC Credits are 5. The aims are developments in scientific and technical progress in their field of specialization and Special care for outstanding students and enabling them to put forward their idea in addition to providing the student with high skill and the ability to solve problems and teamwork. The weekly syllabus includes details of quantity survey introductions, approximate estimate and detailed estimate. In addition to exams. The learning outcomes present the ability to add knowledge in the fields of engineering science and project management, also, the ability to add knowledge in the areas of quantity survey, and contracts management.			

Module 49

Code	Course/Module Title	ECTS	Semester
UICE803	Quantity Survey	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	62	63
Description			
This Program provides a summary of the main features of the program and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. The module type of program is core and the ECTC Credits are 5. The aims are developments in scientific and technical progress in their field of specialization and Special care for outstanding students and enabling them to put forward their idea in addition to providing the student with high skill and the ability to solve problems and teamwork. The weekly syllabus includes details of quantity survey introductions, approximate estimate and detailed estimate. In addition to exams. The learning outcomes present the ability to add knowledge in the fields of engineering science and project management, also, the ability to add knowledge in the areas of quantity survey, and contracts management.			

Module 50

Code	Course/Module Title	ECTS	Semester
UICE804	Bridge design	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	62	63
Description			
Bridges play a crucial role in modern infrastructure, connecting communities and facilitating the flow of goods, services, and people. This course will be an introduction to the different kinds of work in the field of bridge engineering. Bridge Engineering is designed to provide students with a solid understanding of bridge analysis, design and management. And they will be able to know anew knowledge and skills and familiarize themselves with new industry-relevant techniques. This course covers a wide range of modules that address the whole life-analysis of bridges from design through to end-of-life, and they help them pursue an exciting career as a bridge engineer with a consultancy, specialist contractor or local authority. Bridge engineering involves the planning, design, construction, operation, and maintenance of bridges to ensure safe and effective transportation of vehicles, people and goods.			

Module 51

Code	Course/Module Title	ECTS	Semester
UICE804	Airport Engineering	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	62	63
Description			
This course addresses the essential knowledge required for airport planning and design. It covers the topics on airport planning, airport terminal, signage, environmental issues, and pavement design. It is a technical elective course offers to Civil Engineering students. Furthermore, the students will become familiar with airport planning and design issues. During the course they will develop an understanding of professional skills relating to airport planning and design of all parts of airport to the point of being able to complete site investigation, as well as selection and preliminary design for a small general aviation airport and understand its relationship to local economic development.			

Contact

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الملحق (4)
وصف المادة الدراسية
Module Description Form

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Construction Materials**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**UICE103**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	-		**College**	-	
Module Leader	Doha Mothefer Abdul-Razzaq		**e-mail**	doha.m.alsaffar@gmail.com	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	MSc	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Dr. Omar Riyadh		**e-mail**	dr.omaralobaidi@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. The main aim is to familiarize students with physical properties and mechanical behavior of various construction materials such clay brick, concrete block glass block sand lime brick…….etc. 2. To make the students capable to suggest the most suitable material which may fit the exact requirement of the construction items. In this course, the technology related to some of the important and widely used construction materials has been dealt with. 3. Robust the confidence of the students in this construction materials domain as they will be able to select appropriate material for the given item of work on site. 4. Provide the student with theoretical concept of the different construction materials. 5. Achieve sustainability, health and safety in the filed of construction.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the properties, characteristics, and applications of various building materials used in construction, including Metals, timber, masonry, and plastic. An ability to understand physical properties, uses, manufacturing process of building materials that are used in structural components. 2. Solve exercises related to the calculation of stresses and deformations in the materials. 3. Implement different engineering tests on Masonry units and find its properties to ascertain suitability of different construction materials. 4. carry out the test procedures for the principal laboratory properties of construction materials and collect and analyses experimental data and present them in a report with summarized conclusions. 5. Differentiate the advantages, disadvantages, availability of the construction materials and the suitability of these materials in construction. 6. Recognize the environmental impact of building materials and construction methods, and explore sustainable alternatives and practices for reducing resource consumption and minimizing waste.
Indicative Contents المحتويات الإرشادية	<u>Part A- Material Selection and Specifications</u> • Factors influencing material selection in construction projects. • Material specifications and standards. • Durability and service life considerations. • Cost analysis and value engineering.[6hrs] <u>Part B- Properties of Materials</u> • Microstructure of materials • Physical Properties • Mechanical properties[6hrs] <u>Part C- Masonry Materials</u> • Bricks, blocks, tile, stone units and mortar. • Types of bricks and blocks. • Types of tiles and their properties. • Masonry material standards and quality control. [8hrs]

	Part D- Bonding Materials • Mortar: properties, types, and uses • Lime: properties, types, and uses • Gypsum: properties, types, and uses. [6hrs] Part E- Metals (ferrous and non-ferrous metals) and alloys • Types and Properties of metals used and their applications in construction (e.g., steel, aluminum). • Steel reinforcement and its role in reinforced concrete. • Corrosion protection of metals in construction. [6hrs] Part F- Timber Products • Introduction to wood as a construction material. • Types of wood and their properties. • Engineered wood products and their applications. • Wood preservation and treatment methods. [6hrs] Part G- Glass • Overview • Types of glass • Properties of glass. • Sustainable glass material. [6hrs] Part H- Polymer Materials • Types of plastics and their properties • Applications of plastics and composites in building construction. • Sustainability and recycling of plastic materials. • Sustainable construction materials. • Green building materials and their benefits. • Innovative materials and technologies in construction. [6hrs] Part I- Miscellaneous Materials • Adhesives • Asbestos • Insulating Materials • Water Proofing Materials • Fiber • Smart Materials • Composite Materials. [6hrs] Part J-Sustainable and Innovative Construction Materials; • Introduction to sustainable construction materials, • green building materials and their benefits • Innovative materials and technologies in construction, future trends in sustainable construction materials[6hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	- Visual Aids and Multimedia: Using visual aids and multimedia to enhance the learning process. - Group Projects and Collaborative Learning: Assigning group projects that require students to work together to solve construction material-related problems. - Field Trips and Site Visits: Organizing field trips to construction sites or visits to manufacturing facilities that produce construction materials. - Interactive Discussions and Debates: Encouraging interactive discussions and debates on topics related to construction materials. - Online Resources and Simulations: Utilizing online resources and simulations to support the learning process. These strategies aim to enhance students' understanding of construction materials and their applications through hands-on interaction and collaborative learning.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction to Construction Materials; Overview of the course and learning objectives, Material Selection and Specifications; factors influencing material selection in construction projects, Material specifications and standards
Week 2	Properties of building materials: physical properties, mechanical properties, chemical properties, and thermal properties
Week 3	Masonry Materials; Introduction to masonry materials: bricks, blocks, tile, and mortar, types of bricks and blocks and their properties
Week 4	Masonry Materials; Types of tiles and their properties, masonry material standards and quality control
Week 5	Masonry Materials; mortar composition, properties, and applications
	Masonry Materials: stone units, their properties and applications in construction.
Week 6	Metals and Alloys; properties of metals used in construction (e.g., steel, aluminum), steel its role in reinforced concrete, Corrosion protection of metals in construction, quiz
Week 7	Wood and Timber Products; introduction to wood as a construction material, types of wood and their properties, engineered wood products and their applications, wood preservation and treatment methods
Week 8	Glass Overview, Types of glass, Properties of glass, and Sustainable glass material.
Week 9	Polymers; Types of plastics and their properties, applications of plastics and composites in building construction, sustainability and recycling of plastic materials
Week 10	Miscellaneous Materials: Adhesives, Asbestos, Insulating Materials, Water Proofing Materials, Fiber, Smart Materials, Composite Materials
Week 11	Sustainable and Innovative Construction Materials; Introduction to sustainable construction materials, green building materials and their benefits
Week 12	Sustainable and Innovative Construction Materials; Innovative materials and technologies in construction, future trends in construction materials
Week 13	**Mid-term Exam**
Week 14	**Recap**
Week 15	**Preparatory week before the final Exam**
Week 16	**final Exams**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Student Responsibilities, Report Writing, overview on List of Experiments
Week 2	Shape & dimension test of clay brick, Determination of water absorption of bricks
Week 3	Efflorescence test for Brick
Week 4	Compressive strength of clay bricks

Week 5	Tile dimensions and shape
Week 6	Water absorption of tile, face Water absorption test of tile
Week 7	Modulus of rupture of tile
Week 8	Shape & dimension test of Stones, Determination of water absorption of stones
Week 9	Compressive strength of Blocks
Week 10	Fineness of gypsum test, Standard consistency
Week 11	Setting time of gypsum
Week 12	Fineness of Lime test, Standard consistency
Week 13	Modulus of rupture of Timber
Week 14	Other Different construction materials tests.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	1. Peter Domone and John Illston (2010) construction materials, their nature and behaviou, 4th ed, Spon Press 2. Duggal, S. K. (2017). Building materials. Routledge. 3. Khatib, J. (Ed.). (2016). Sustainability of construction materials. Woodhead Publishing.	No
Recommended Texts	Venkateshwara, P., & Vishnukanth, M. (2006). Building Materials and Construction (For the Course of Water Supply and Sanitary Engineering). Hyderabad: The Telugu Akademi.	No
Websites	https://www.masterclass.com/articles/building-materials-guide	

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 Information معلومات المادة الدراسية					
Module Title	**Engineering Drawing**			**Module Delivery**	
Module Type	**Core**			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**UICE105**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Mostafa Waleed		**e-mail**	mostafa.waleed@aliraqia.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Mohammed Ghazi		**e-mail**	mohammed.ghazi@aliraqia.edu.iq	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The aim of this module is to provide students with a comprehensive understanding of engineering drawing principles and techniques. It aims to develop their skills in creating and interpreting technical drawings, which are essential in the field of engineering. The module also aims to enhance students' spatial visualization abilities and their understanding of the relationship between 2D representations and 3D objects.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate an understanding of the principles and conventions of engineering drawing. 2. Apply appropriate techniques to create accurate and precise engineering drawings. 3. Interpret and analyze technical drawings, including dimensions and annotations.

	4. Use CAD (Computer-Aided Design) software effectively to generate engineering drawings. 5. Demonstrate proficiency in visualizing and sketching 3D objects from different perspectives.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A- Introduction to Engineering Drawing</u> • Importance of engineering drawing in the design and manufacturing process. • Standards and conventions in engineering drawing. • Types of technical drawings: orthographic projections, isometric projections, etc. [3hrs] <u>Part B- Drawing Instruments and Techniques</u> • Overview of drawing instruments and their uses. • Sketching techniques and line types. • Scaling, dimensioning, and labeling [3hrs] <u>Part C- Orthographic Projections</u> • Principles of orthographic projection. • Multiview drawings. • Sectional views and conventions. [25hrs] <u>Part D- Isometric Projections</u> • Introduction to isometric projections. • Isometric drawing techniques and isometric scales. • Isometric views of objects and assemblies. • Extracting 2D Drawings form Isometric drawing. [29hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	In this module, a combination of project-based learning, lectures, and group discussions will be utilized to create an engaging learning environment. Students will apply engineering drawing principles and techniques to real-world scenarios, participate in interactive lectures using visual aids and examples, collaborate in group discussions to analyze and problem-solve, engage in practical exercises and workshops to develop technical drawing skills with traditional tools and CAD software, and conduct independent study.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	38	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**In Class Applications**	1	20% (20)	Continuous	All
	Projects	1	20% (20)	Continuous	All
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction to Engineering Drawing
Week 2	Sketching techniques and line types & Scaling, dimensioning, and labeling
Week 3	Continued
Week 4	Principles of orthographic projection
Week 5	Multiview drawings in orthographic projection
Week 6	Sectional views and conventions
Week 7	Mid-term Exam
Week 8	Introduction to isometric projections
Week 9	Isometric drawing techniques and isometric scales
Week 10	Isometric views of objects and assemblies
Week 11	Extracting 2D Drawings form Isometric drawing
Week 12	Orthographic project of small frame structure

Week 13	Continued
Week 14	Isometric drawing of small frame structure
Week 15	Continued
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Giesecke, Frederick Ernest, et al. Technical drawing with engineering graphics. Vol. 15. Prentice Hall, 2016.	Yes
Recommended Texts	1. French, Thomas Ewing, and Charles J. Vierck. The fundamentals of engineering drawing and graphic technology. McGraw-Hill Companies, 1978.	Yes
Websites	https://sphero.com/blogs/news/engineering-drawing	

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	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE101**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		1	**Semester of Delivery**		1
Administering Department		-	**College**	-	
Module Leader	Aseel Qadoorri		**e-mail**	aseel20071984@gmail.com	
Module Leader's Acad. Title		**Asst. Lecture**	**Module Leader's Qualification**		**M.Sc**
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Dr.Mohanad Hatem	**e-mail**	mohshadhar@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	Physics	**Semester**	1

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Explain the principles basic definitions and introductory concepts of engineering mechanics/statics. 2. Analyze forces and find out the resultant forces in plane and space. 3. Differentiate between various type of supports and draw free-body-diagram, compute the reaction force in simple structure (beam, frame, truss). 4. Explain the principles of static equilibrium and solve problems relating to dry friction. 5. Use free body diagrams to solve static problems involving components and pulley systems 6. Solve problems relating to the forces in truss members using the method of joints and the method of sections.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	7. Analyze units, and basic principles. 8. Solving problem of equilibrium plane and space. 9. Solving Truss problems. 10. Define Newton's laws of motion. 11. Recall trigonometric laws and apply to the addition and decomposition of vectors quantities. 12. Identify the moment of a force and calculate its value about a specified axis. Define the moment of a couple. 13. Describe the concept of dry friction and analysis the equilibrium of rigid bodies subjected to this force. 14. Construct "Free Body Diagrams" of real-world problems and apply Newton's Laws of motion and vector operations to evaluate equilibrium of particles and bodies. 15. Apply the principles of equilibrium of particles and bodies to analysis the forces in planar truss members.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Part A- Introduction Introduction, units, definitions and basic principles. [6hrs] Part B- Forces Resultant • Forces, forces resolution and combination in plane and in space. [10hrs] • Rigid Body Force Systems, moment of a force about a point, moment of a force about an axis. [10hrs] • Rigid Body Force Systems, couples, reduction of force and couple systems, • resultant of concurrent coplanar force system resultant of parallel coplanar force system. [10hrs] • Resultant of non-concurrent non parallel coplanar force system. (10hr) Part C- Equilibrium • Equilibrium of a Particles, free body and force diagrams; equilibrium of a particle. [10hrs] • Equations of equilibrium, Equilibrium of a rigid body plane, Solving equation of equilibrium plane, Equations of equilibrium, Equilibrium of a rigid body space, Solving problem of equilibrium space [10hrs] Part D- Trusses: • Joints method. • Section method, Solving Truss problems [10hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The formal learning activities are a combination of lecture and tutorial style formats. For example, new material will be presented and supported by problem solving exercises (formative assessment) to be completed by students. Students will benefit from participation in the interactive environment during formal contact times.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	113	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	20% (20)	2,3, 10,15	LO #1, 2,7 and 8
	Assignments	2	10% (10)	4,7	LO #3 and 4
	Report	1	10% (10)	13	LO # 8
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

0

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction, course orientation, units, definitions and basic principles.
Week 2	Forces, forces resolution and combination in plane and in space
Week 3	Rigid Body Force Systems, moment of a force about a point, moment of a force about an axis.
Week 4	Rigid Body Force Systems, couples, reduction of force and couple systems.
Week 5	Resultant of concurrent coplanar force system
Week 6	Resultant of parallel coplanar force system.
Week 7	Resultant of non-concurrent non parallel coplanar force system.
Week 8	Equilibrium of a Particles, free body and force diagrams; equilibrium of a particle.
Week 9	Equations of equilibrium, Equilibrium of a rigid body plane
Week 10	Solving equation of equilibrium plane
Week 11	Equations of equilibrium, Equilibrium of a rigid body space
Week 12	Solving problem of equilibrium space
Week 13	Trusses: method of joints
Week 14	Trusses: method of sections
Week 15	Solving Truss problems
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Meriam, J. L. & Kraige, L. G. (2013). **Engineering Mechanics Statics,** 7th Edition, Wiley. 2. Hibbeler, R. C. (2017). *Engineering Mechanics Statics,* 14th Edition in SI units, Pearson.	Yes
Recommended Texts	3. Beer, Ferdinand Pierre, et al. *Vector mechanics for engineers*. Vol. 4. New York: McGraw-Hill, 1977.	NO
Websites	http://www.adelaide.edu.au/mathslearning/resources/statics/	

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	**Human rights**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**UI100**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	**1**		**Semester of Delivery**	**1**	
Administering Department			**College**	Civil Engineering	
Module Leader	Kifaa Abdulkareem shaker		**e-mail**	Kifaa.kareem@gmail.com	
Module Leader's Acad. Title	Asst. Lecture		**Module Leader's Qualification**	**MSc**	
Module Tutor	-		**e-mail**	E-mail	
Peer Reviewer Name	Dr. Ammar Mezal		**e-mail**	ammar.mezal @gmail.com	
Scientific Committee Approval Date	03/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Introduce students to human rights and duties towards society. 2. Highlight the importance of knowing the rights of the individual in carrying out his duties to the fullest. 3. Learn about the history of human rights and the stages of their development through the ages. 4. To promote the culture of human rights among students, to take care of the rights of others and to promote a culture of peace based on justice and respect for human rights. 5. To promote people's awareness of their rights, to enable them to transform the principles of human rights into a social, cultural, economic and political reality. 6. The development and prosperity of the human personality with its emotional, intellectual and social dimensions and its sense of dignity, freedom, equality and social justice.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Preparing graduates who are familiar with human rights and safeguarding these rights. 2. Creating confidence in the student during the dialogue about human rights 3. Raise the spirit of cooperation and work within a team 4. Study theories of human rights and democracy 5. Clarify the historical stages of human rights 6. Clarify the most important rights and duties of an individual 7. Knowing the rights and duties of the Iraqi individual 8. Respect for others' rights and non-infringement to ensure a better society.
Indicative Contents المحتويات الإرشادية	1. The concept of human rights and objectives and characteristics of human rights and its concept in ancient civilizations and heavenly religions [10hrs.] 2. Sources of Human Rights in Iraq Civil Rights, Political Rights, Economic rights, social rights and cultural rights. [10 hrs] 3. Individual freedoms and their types. [6 hrs] 4. Means of protection of human rights. Including legal protection and judicial protection [4 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1) Direct discussion about asking questions, opening dialogue and interacting with students 2) Tests and Exams. 3) Strategies for thinking within a group 4) Critical thinking strategy in learning 5) Connection between Theory and Application. 6) In- and Out-Class oral conservations. 7) Reports, Presentations, and Posters.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	1	10% (10)	5	LO #1, 2,6 and 7
	Assignments	1	10% (10)	9	LO #3 and 4
	Report	2	20% (20)	4, 11	LO # 7,9
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	LO # 1-9
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Origins of civil rights and freedom, including: legislation for civil rights.
Week 2	objectives and characteristics of human rights
Week 3	Legal basis for the rule of law
Week 4	human rights in ancient civilizations & ancient heavenly religions
Week 5	Sources of Human Rights in Iraq
Week 6	Understanding civil rights, economical conception of civil rights
Week 7	Legal basis for the rule of law
Week 8	legal protection
Week 9	social rights
Week 10	cultural rights
Week 11	individual freedoms
Week 12	Mid Exam
Week 13	judicial protection
Week 14	Types of individual freedoms
Week 15	Freedom of owning property, capitalistic & socialist understanding of ownership
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Book of Human Rights حقوق الانسان بين النص والتطبيق دكتور علي الشكري	Yes
Recommended Texts	حقوق الانسان دكتور ماهر علاوي	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	**Mathematics I**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE103**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		1	**Semester of Delivery**		1
Administering Department		-	**College**	-	
Module Leader	Ibtihaj Abdulwahhab Abdulrazzak		**e-mail**	dr.eng.ibtihaj@gmail.com	
Module Leader's Acad. Title		Assistant Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Mahmood Mohammed Hamza	**e-mail**	mmshs1988@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	At the end of the course, the student will be familiar with: 1. The fundamental of mathematics including functions and their graphs and shifting. 2. To enable students to understand and solve the general Integration problems. 3. To enable students to understand and solve the Derivatives of all functions. 4. Matrix calculations
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Learning how to think, apply and visualize by drawing functions. 2- Studying and understanding the problem and true thinking to find a correct solution 3- Study and analyze the problem and how to select the best solution 4- Developing skills through understanding, solving, then comparing 5- Improve the observation, collecting information, comparing and analyzing the results 6- Develop general skills (skills related to the personal development) to achieve a correct solution
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Functions</u> Definition of functions (Line, Circle, Ellipse, Parabola, Trigonometric functions). Equations of functions. Graph the functions and graph the shifting functions. Find the limits and continuity. [15hrs] <u>Part B - Derivatives</u> Explanation the Differentiations and finding the derivatives of different functions. Applying Chain Rule in differentiations. L'Hopital Rule and finding the slop of the functions as an applications of derivatives. [15hrs] <u>Part C – Integration</u> Explanation the Integration (definite and indefinite Integration). Use the integration to find the area between curves as an application of integration. [15hrs] <u>Part D - Matrix and Determinants</u> Identifying matrices and Determinants and their properties. Using matrices to find the variables in equations by applying Cramer's rule. [15hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The course is taught through three approaches: Classroom lectures to present the basic mathematics, online lectures, and interactive tutorials to solve the problems to encourage students' participation in the exercises.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	5, 10	LO #1, 2, 5
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6
	Report	1	10% (10)	13	LO # 3, 4 and 6
	Midterm Exam	2 hr	10% (10)	7	LO # 1-6
Summative assessment	**Final Exam**	3 hr	50% (50)	15	All
	100% (100 Marks)				

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Functions	
Week 1	1-1 Line, Circle, Ellipse, Parabola, Trigonometric functions
Week 2	1-2 graph and shifting a graph of functions
Week 3	1-3 Limits
Week 4	1-4 Continuity
Derivatives	
Week 5	2-1 Differentiations

Week 6	2-2 Chain Rule
Week 7	2-3 Higher Derivatives
Week 8	2-4 Implicit Differentiation
Week 9	2-5 Applications of Derivatives
Integration	
Week 10	3-1 Integration definite and indefinite Integration
Week 11	3-2 applications of Integration
Week 12	3-3 Area between curves
Matrix and Determinants	
Week 13	4-1 Determinants of second and third orders
Week 14	4-2 Properties of determinants
Week 15	4-3 Cramer's rule
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	- Thomas Calculus", 12th ED, George B. Thomas Jr., Maurice D. Weir, Joel R. Hass, 2009 - Mathematics For Engineers: A Modern Interactive Approach", 2nd ED, Tony Croft and Robert Davison, 2003.	Yes
Recommended Texts	- Scientific journals and mathematical researches in mathematic their applications	No
Websites	Electronic references, Internet sites, Application of mathematics https://byjus.com/maths/differentiation/ https://byjus.com/maths/integration/ https://www.cuemath.com/algebra/matrices-and-determinants/	

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	**Physics for Engineers**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE104**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	-		**College**	-	
Module Leader	Assit.Lec. Roa Ayad		**e-mail**	Roaaayad90@gmail.com	
Module Leader's Acad. Title	Assistant Lecture		**Module Leader's Qualification**	MSC	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Mahmood Mohammed		**e-mail**	mmhsh1988@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. The student will be able to deal with systems of physical units, distinction between physical quantities, vector analysis and its applications. 2. Develop the student's ability to understand The Concept of Force Newton's Laws and Gravitational Force, Weight Free body diagram, with learning the Forces of Friction. 3. Identify the definition of torque, Center of Gravity and The Rigid Object in Equilibrium. 4. Learn about the elastic properties of solids and what are the modulus of elasticity. 5. Understand the principle of constant force and know the difference between kinetic energy and potential energy and identify the law of conservation of energy. 6. Identify the properties of liquids (density, pressure, surface tension, and viscosity) with learn the method of measuring pressures, and understand the continuity equation, Bernoulli's equation and its applications. 7. Identify thermal expansion, its types and how to measure it. 8. Understanding the properties of waves, sound waves and their speed, learning about the Doppler effect, ultrasound and its applications. 9. Understanding the nature of light and its properties, and identifying some of the applications of light. 10. Learn about electric field and magnet field and what is the difference between them.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Writing the correct units and dimensions of physical quantities and know the concept of friction. 2. Identify the definition of torque, Center of Gravity and The Rigid Object in Equilibrium. 3. Identify Solids, identifying the meaning of viscosity and knowing the modulus young's, shear, and bulk. 4. Define constant forces, kinetic energy and potential energy and conservation of energy. 5. Explain the properties of liquids, and understand the continuity equation, Bernoulli's equation and its applications. 6. Define thermal expansion and list the various types of it. 7. Explain the properties of sound waves and the Doppler effect, ultrasound and its applications. 8. Identify the nature of light and its properties, refracting and refraction and i the applications of light. 9. Explain Electricity, resistivity and the concept of current, resistance and explain electric field and magnet field.
Indicative Contents المحتويات الإرشادية	• History and nature of science. [5hrs] • Metric system, units of measurements. [5hrs] • The atomic nature of matter. [5hrs] • States of matter. [5hrs]

	• Liquids. [5hrs] • Solids, elasticity, young's modulus, shear modulus and bulk modulus. [5hrs] • Forces, work, energy, momentum, power and friction. [5hrs] • Electricity. [5hrs] • Thermal expansion. [5hrs] • Simple harmonic motion (kinetic and potential energy). [5hrs] • Electrical and magnetic properties of matter. [5hrs] • Magnetic states of matter, a diamagnetic, paramagnet ferromagnetic and ferromagnetic. [5hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy In Civil Engineering, the laws of physics can tell you about forces, tension, tensile strength, elasticity, and all kinds of other concepts that you can use to make calculations about your designing and construction work.

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

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	History and nature of science
Week 2	Metric system , units of measurements
Week 3	The atomic nature of matter
Week 4	States of matter - solids , liquids, gases, qualitative differences between solids, liquids and gases
Week 5	Continued
Week 6	Liquids, structure of liquids, surface energy, surface tension capillary action, flow properties and viscosity
Week 7	Solids, elasticity, young's modulus, shear modulus and bulk modulus
Week 8	Forces, work, energy, momentum, power and friction
Week 9	Electricity, charge, current, resistance, resistivity , thermistor, galvanometer, ammeter and voltmeter
Week 10	Thermal expansion, linear, surface and volume expansion , transfer of heat, temperature and scales
Week 11	Simple harmonic motion (kinetic and potential energy)
Week 12	Electrical and magnetic properties of matter, insulators, conductors, semiconductor and superconductors
Week 13	Continued
Week 14	Magnetic states of matter, a diamagnetic, paramagnet ferromagnetic and ferromagnetic
Week 15	Continued
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Simple pendulum
Week 2	Hook's law
Week 3	Forces test
Week 4	Melting and freezing point
Week 5	Ohm's law

Week 6	Faraday's law
Week 7	Refractive index

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Engineering Physics, Dr. Hasan Maridi, 1st edition, 2017	
Recommended Texts	Physics for Scientists and Engineers , Thomson Brooks/Cole © 2004, 6th Edition,	No
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	**Computer Aided Graphics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE205**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	-		**College**	-	
Module Leader	Mohammed ghazi abbas		**e-mail**	mohammed.ghazi@aliraqia.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Msc	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Dr.Mostafa Waleed		**e-mail**	mostafa.waleed@aliraqia.edu.iq	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills and understanding of circuit theory through the application of AutoCAD. 2. Describing the AutoCAD program and Its icons, knowing what's new in AutoCAD version. 3. The students will have skills to use that's program and drawing any things (2D). 4. Reading plans of projects. 5. The Autodesk Revit 2023 course will teach students how to create and modify grids, levels, walls, doors, etc. They will also learn how to manage views and create 3D renderings of them projects.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learn drawing skills by AutoCAD. 2. Learn to read construction plans by AutoCAD. 3. Practical, project-focused exercises encourage readers to "learn by doing," giving them a deeper understanding of the BIM. 4. Power User/BIM Manager tips throughout the text offer readers practical insights on what is required to manage building information modeling in a modern architectural setting. 5. Creating and Modifying Components by Revit. 6. Modeling and Modifying Elements by Revit. 7. Managing Views by Revit. 8. Managing Documentation by Revit.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Title bar the name of the AutoCAD program (with its version) and the name of the file are displayed. • Menu bar. • Toolbars. • Drawing Window. • Command Window. • Status Bar. • Creating and Modifying Components by Revit. • Modeling and Modifying Elements by Revit. • Managing Views by Revit. • Managing Documentation by Revit.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- The AutoCAD program allows building a technical visualization of industrial and engineering models, drawings and artistic ideas, in addition to the possibility of modification and restructuring on ready-made designs, so that the program is suitable for all uses.

	2- Making the student ready for the labor market by knowing the importance of AutoCAD in the site, how to read plans and clarify the ideas. 3- **Revit** combines a straightforward, reader-friendly style with detailed project-focused exercises that encourage you to learn by doing. Readers will gain practical, firsthand experience with the powerful and popular Autodesk® Revit® software leading architects and building design professionals are using to move beyond traditional Computer Aided Design (CAD) and drafting to manage complex projects, foster collaboration and boost productivity. 4- Revit offers the modern architect everything they need to be successful in today's competitive market.

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

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
week	**Material Covered**
Week 1	Introduction - Theory lectures on history of AutoCAD program, what's new versions ,how to install program. Explanation the main window for program, how to arrange it before start work.
Week 2	Toolbar
Week 3	continued
Week 4	term Exam + tutorial. And Application of previous orders. Layer order
Week 5	Explanation of construction and architectural plans and types of lines (showing examples) and Application of previous orders.
Week 6	The history of the Revit and the most important versions, apply projects, quick access toolbar
Week 7	Modify and Architecture orders
Week 8	Navigation bar and main orders
Week 9	Systems and insert
Week 10	Systems and insert, annotation
Week 11	Application of previous orders.
Week 12	Modify and Architecture orders
Week 13	Application of previous orders.
Week 14	Mid exam
Week 15	continued
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- Shoukry Y, Pandey J. Practical Autodesk AutoCAD 2021 and AutoCAD LT 2021: A no-nonsense, beginner's guide to drafting and 3D modeling with Autodesk AutoCAD. Packt Publishing Ltd; 2020 May 15. 2- Autodesk Revit 2023	No
Recommended Texts	1- Introduction to AutoCAD 2021 for Civil Engineering Applications: Learning to use AutoCAD for Civil Engineering Projects 1st Edition by Nighat Yasmin. 2- Autodesk Revit 2023 Architecture Fundamentals By ASCENT Published July 25, 2022	No
Websites	https://www.autodesk.com/ and /https://accounts.autodesk.com	

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 Geology**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**UICE204**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	-		**College**	-	
Module Leader	Sarah Dhurgham Al-Jarjees		**e-mail**	sarah.aljarjees@aliraqia.edu.iq	
Module Leader's Acad. Title	Assistant lecturer		**Module Leader's Qualification**	MSc.	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Mustafa Jamal Abrahim		**e-mail**	mustafajamal763@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Understanding the basic definitions and introductory concepts of geological processes and their impact on engineering projects. 2. To teach students geotechnical engineering principles and topics, like soil properties, slope stability, foundation design, and soil improvement techniques. 3. Identify soils and explain its physical and mechanical properties (Shear strength). 4. Soils, minerals, and rocks formations, types, and properties. 5. To classify the different soil types according to USCS 6. The physical and mechanical properties of rocks, identify the different factors affecting the rock properties, with the structural geology for different rocks. 7. Identify all factors affecting the earth crust and its components (internal and external forces). 8. To understand the concept of earthquakes, classify earthquake according to Mercalli or Richter scales. 9. To understand surface and ground water distribution. 10. To develop students' skills in reading maps, identifying geological formations, and understanding their implications for engineering projects. 11. The course aims to ensure successful integration of geological knowledge into engineering projects. 12. To equip students with the knowledge and skills to ensure safe and sustainable design and construction practices.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Students would understand the main principles of engineering geology, and its impacts on engineering projects. 2. The student would be able to identify soils and explain its physical and mechanical properties (Shear strength) 3. To classify the different types of soil according to USCS 4. Discuss the physical and engineering properties of rocks. 5. Students will be able to differentiate various types of minerals and rocks formations. 6. The student would be able to calculate the normal stress and strain of rocks and soil samples 7. Students will study the mechanical behavior of soils and rocks under different loading conditions. 8. They will learn about concepts such as stress, strain, deformation, and failure criteria, this knowledge is essential for designing foundations, slopes, and retaining structures. 9. Understand and read topographic and geological maps. 10. Explain surface and ground water distribution.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following Part A – Introduction to Engineering Geology

	Introduction to Engineering Geology, engineering geology applications, relationship between geology and civil engineering, earth structure (crust, mantle, core), geological cycle.[10hrs] Part B – Minerals and rocks Soil, Soil weathering, soil formation, classification, physical and mechanical properties (Shear strength), transported and residual soils, classify the different soil types according to USCS, Minerals and rocks, crystallography, mineral composition, definition and occurrence, types of minerals, rocks (definition + rock cycle), sedimentary rocks, metamorphic rocks, physical and engineering properties of rocks, soils of Iraq. [15hrs] Part C- Structural geology Types of earth movements, basic definitions, folds, faults, joints, and their types, Surface, erosion of rocks, mechanical behavior of soils and rocks under different loading conditions, mechanical properties of rocks (applications), and ground water. [10hrs] Part D -Topographic and geological maps Geotechnical and geological maps. [5hrs] Part E- Surface and ground water Surface and ground water distribution. [5hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is Interactive lectures and demonstrations to enhance student engagement by utilizing visual aids, such as diagrams, photographs, and videos, which help illustrate complex geological concepts and processes. besides, Interactive discussions, question-and-answer sessions, and group activities strategies will be incorporated into this course to encourage active participation and facilitate knowledge retention.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 3, 4, 5, 6, and 7
	Assignments	2	10% (10)	2, 12	LO #1, 2, 3, 4, 5, 6, 7 and 8
	Seminar	1	10% (10)	15	All
	Report	1	10% (10)	12	LO #1, 2, 3, 4, 5, 6, 7 and 8
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-6
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction: Relationship between geology and civil engineering, earth structure (crust, mantle, core), geological cycle
Week 2	Minerals and rocks: soil, soil weathering, soil formation, classification, physical and mechanical properties (Shear strength)
Week 3	Minerals and rocks: transported and residual soils, classify the different soil types according to USCS
Week 4	Minerals and rocks: crystallography, mineral composition, definition and occurrence, types of minerals
Week 5	Minerals and rocks: rocks (definition + rock cycle), sedimentary rocks, metamorphic rocks
Week 6	Minerals and rocks: physical and engineering properties of rocks, soils of Iraq.
Week 7	Mid-term Exam
Week 8	Structural geology: basic definitions, types of earth movements, folds, faults, joints, and their types.

Week 9	Structural geology: erosion of rocks, mechanical behavior of soils and rocks under different loading conditions.
Week 10	Structural geology: mechanical properties of rocks (applications).
Week 11	Physical and engineering properties of rocks
Week 12	Topographic and geological maps
Week 13	Continued
Week 14	Continued
Week 15	Surface and ground water + seminar
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. K. M. BANGAR (1995) :"A textbook of Geology: General and Engineering". Standard Publisher Distributors,Lumos Offset Press, Delhi, India. 2. MUNI BUDHU (2011):" Soil Mechanics and Foundations". 3rd edition, John Wily & Sons, Inc., USA.	No
Recommended Texts	1. Hencher, S., 2013. Practical engineering geology.	No
Websites	https://geology.com/	

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 II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE202**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	-		**College**	-	
Module Leader	**Aseel Qaddoori**		**e-mail**	aseel20071984@gmail.com	
Module Leader's Acad. Title	Asst.Lecture		**Module Leader's Qualification**	MS.c	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Dr. Mohanad Hatem		**e-mail**	mohshadhar@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Engineering Mechanics I	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Explain centroid and moment of inertia a for various shapes. 2. Describe the motion of a particle in terms of its position. 3. Demonstrate velocity and acceleration in different frames. 4. Analyze the forces causing the motion of a particle. 5. Use the equation of motion to describe the accelerated motion of a particle. 6. To apply work, energy, impulse and momentum relationships for a particle in motion. 7. Describe the motion of a rigid body in different frames of reference
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Solving Rectilinear Motion of a particle. 2. Solving Angular Motion of a Line and motion of projectile. 3. Solving problem Curvilinear Motion of Particle using normal and tangential component, and using radial and transverse components. 4. Find Motion of rigid bodies. 5. Find Kinematics relative motion and kinetics- force. 6. To find Mass, acceleration, centroids and center of gravity. 7. To solving problem Kinetics-Work and Energy. 8. understand dynamics, definitions and basic principles.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part A- static</u> • Centroids and Center of Gravity • Second Moment or moment of inertia. [10hrs] <u>Part B- Rectilinear Motion</u> • Dynamics, definitions and basic principles. [4hrs] • Rectilinear Motion of a particle. [4hrs] • Angular Motion of a Line. [6hrs] <u>Part C- Curvilinear Motion</u> • Motion of particle using rectangular components. • Motion of Particle using normal and tangential components. • Motion of particle using radial and transverse components. [5hrs]. • Motion of Projectile. [4hrs] • Motion of rigid bodies. [4hrs] <u>Part D- Kinematics relative motion</u> • Kinematics relative motion, Kinetics- Force, Mass and acceleration. [15hrs] • Kinetics-Work and Energy. [6hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1) Tutorials. 2) Homework and Assignments. 3) Tests and Exams. 4) In-Class Questions and Discussions. 5) Connection between Theory and Application. 6) Extracurricular Activities. 7) In- and Out-Class oral conservations. 8) Reports, Presentations, and Posters.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	20% (20)	1,4, 11,13	LO #1, 2,6 and 7
	Assignments	2	10% (10)	5,14	LO #3 and 8
	Report	1	10% (10)	7	LO # 4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	10	LO # 1-6
	Final Exam	2hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Rectilinear Motion of a particle.
Week 2	Angular Motion of a Line.
Week 3	Curvilinear Motion of particle using rectangular components.
Week 4	Motion of Projectile.
Week 5	Curvilinear Motion of Particle using normal and tangential components.
Week 6	Curvilinear Motion of particle using radial and transverse components.
Week 7	Motion of rigid bodies.
Week 8	Kinematics relative motion.
Week 9	Kinetics- Force.
Week 10	Mass and acceleration.
Week 11	Centroids and Center of Gravity.
Week 12	Second Moment or moment of inertia.
Week 13	Kinetics-Work and Energy.
Week 14	Dynamics, definitions and basic principles.
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Meriam, J. L. & Kraige, L. G. (2013). **Engineering Mechanics Statics,** 7th Edition, Wiley. 2. Hibbeler, R. C. (2017). *Engineering Mechanics Statics,* 14th Edition in SI units, Pearson.	Yes
Recommended Texts	1. I. H. Shames, Engineering Mechanics: Statics and dynamics, 4th Ed, PHI, 2002. 2. F. P. Beer and E. R. Johnston, Vector Mechanics for Engineers, Vol I - Statics, Vol II – Dynamics, 9th Ed, Tata McGraw Hill, 2011.	No
Websites	https://highered.mheducation.com/sites/0073380318/information_center_view0/	

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	**English Language**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☒ **Practical** ☒ **Seminar**	
Module Code	**UI201**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		1	**Semester of Delivery**		2
Administering Department		-	**College**	-	
Module Leader	Sarah Dhurgham Al-Jarjees		**e-mail**	sarah.aljarjees@aliraqia.edu.iq	
Module Leader's Acad. Title		Lecturer Assistant	**Module Leader's Qualification**		MSc.
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Dr. Mohanad Hatem	**e-mail**	mohshadhar@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**		1

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. This course aims to enable the learner to use English effectively for study purposes across the curriculum. 2. To enable learners to grasp the technical engineering terms and to use them in real-life situations. 3. To develop and integrate the usage of Civil- technical English terms and vocabulary with speaking and writing skills. 4. To enhance the ability to write clear, concise, and accurate technical texts using a wide range of technical vocabulary. 5. To communicate easily and appropriately in real-life situations. 6. To introduce learners to the lifelong learning and self-development available resources for English language learning.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Communication Skills: Students will demonstrate effective communication skills in the English language, specifically tailored to the field of civil engineering. 2. Technical Vocabulary: Students will acquire a comprehensive understanding of technical vocabulary specific to civil engineering. They will be proficient in using industry-specific terms and terminology related to construction, structural engineering, geotechnical engineering, transportation engineering, and other relevant sub-disciplines. 3. Reading Comprehension: Students will develop advanced reading comprehension skills, enabling them to understand technical documents and engineering specifications written in English. 4. Writing Skills: Students will be introduced to the technical writing skills that required in civil engineering, such as geometric shapes description. 5. Continuous Learning: Students will recognize the importance of lifelong learning and self-improvement in the ever-evolving field of civil engineering. They will develop strategies for independent learning, such as utilizing online resources, staying updated with industry publications, and actively seeking opportunities for professional development.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – English grammar basics</u> - English tenses (Present simple, Past simple regular and irregular, Present continuous, Future tense). - Possessive adjectives. - Prepositions. - Conditional sentences.[8hrs] <u>Part B – Technical English vocabulary and terminology</u> - Collocations, Compound words, Idiomatic expressions, industry-specific terms, and technical vocabulary delivered as texts related to construction, structural engineering, geotechnical engineering, transportation engineering, and sanitary engineering. [8hrs] <u>Part C – General language skills</u>

	- Reading skills (skimming and scanning). - Writing skills (2D & 3D shapes description, principles of writing a technical report). - Request and offers. [8hrs] Part D – Long life learning concept - Utilizing online resources, industry publications, and professional development platforms. [6hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The strategy for teaching this course is the communicative approach. It will focus on encouraging active participation and engagement from students, emphasizing real-life communication situations Instead of solely focusing on grammar rules and vocabulary memorization. Students will be given tasks or projects that require them to use English to achieve a specific goal, encouraging collaboration, critical thinking, and language production. Besides, the four language skills - listening, speaking, reading, and writing are integrated into lessons to reflect how language is used in real-life situations.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO # 1, 2, 3 and 4
	Assignments	2	10% (10)	2, 12	LO # 1, 2, 3 and 4
	Seminar	1	10% (10)	13	LO # 5
	Report	1	10% (10)	15	LO # 4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-3
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to English grammar - English tenses (Present simple, Past simple regular and irregular) + Possessive adjectives.
Week 2	English grammar - English tenses (Present continuous, Future tense) + Prepositions.
Week 3	English grammar - Conditional sentences Technical English vocabulary - text on construction materials topic, including idiomatic expressions.
Week 4	Technical English vocabulary - text on structural engineering topic, including idiomatic expressions.
Week 5	Technical English vocabulary - text on geotechnical engineering topic including idiomatic expressions.
Week 6	Technical English vocabulary – Collocations + Compound words
Week 7	Mid-term Exam
Week 8	Reading skills - skimming and scanning skills.
Week 9	Technical English vocabulary - text on transportation engineering topic including industry-specific terms.
Week 10	Technical English vocabulary - text on sanitary engineering topic including industry-specific terms.
Week 11	Writing skills (2D & 3D shapes description).
Week 12	Introduction to professional development platforms and utilizing online resources.
Week 13	Seminar
Week 14	Writing skills (principles of writing a technical report).
Week 15	Practical training on industry publications reading.

Week 16	Preparatory week before the final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Technical English for Civil Engineering. Izar Landeta, J.M., 1st edition. ISBN: 968-7674-66-0 2. New Headway: Intermediate. John Soars and Liz Soars, 4th edition, Oxford publication.	No
Recommended Texts	1. Technical English for Civil and Structural Engineers. Kambiz Narmashiri and Fatemeh Daliri A., 1st edition. ISBN: 9783848484300	No
Websites	1. https://www.coursera.org/learn/writing-english-university 2. https://www.futurelearn.com/courses/english-for-stem-understanding-engineering-vocabulary	

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	**Mathematics II**			**Module Delivery**	
Module Type	**Basic Learning Activities**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE203**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Ibtihaj Abdulwahhab Abdulrazzak		**e-mail**	dr.eng.ibtihaj@gmail.com	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Mahmood Mohammed Hamza		**e-mail**	Mmshs1988@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mathematics I	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To enable students to understand the methods of integration. 2. To enable students to understand the Multivariable functions and partial derivatives. 3. To enable students to understand the Differential equations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify the goals, imagination and thinking. 2. Understanding the problem to find a suitable solution 3. Studying the problem and choosing the best method to solve it. 4. Developing skills through understanding, solving, then comparing the results. 5. Improve the observation, focusing, remembering and analyzing results 6. Developing skills (skills related to employability and personal development) to achieve a realistic thinking and treatment.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Methods of integration Solving mathematical problems by using different methods (Substitution method, Integration by parts, Partial fractions, Tabular method, Integration powers of Sin and Cos).[20hrs] Solving the Improper integral to find converge and diverge integrals. Part B - Multivariable functions and partial derivatives Identifying Functions of several variables and finding Limit and continuity, Application of Partial derivatives, Differentiability, and Linearization. Chain rule. [20hrs] Part C- Differential equations Using First order differential equations. Variable separable. Homogeneous equation and non- homogeneous second order with constant coefficients. [20hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The course is taught through three approaches: Classroom lectures to present the basic mathematics, online lectures, and interactive tutorials to solve the problems to encourage students' participation in the exercises.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	5, 10	LO #1, 2, 5
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6
	Report	1	10% (10)	13	LO # 3, 4 and 6
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	50% (50)	15	All
			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Methods of integration.	
Week 1	1-1 Substitution method
Week 2	1-2 Integration by parts
Week 3	1-3 Partial fractions
Week 4	1-4 Tabular method
Week 5	1-5 Integration powers of Sin and Cos
Week 6	1-6 Improper integral
Multivariable functions and partial derivatives	

Week 7	2-1 Functions of several variables
Week 8	2-2 Limit and continuity
Week 9	2-3 Partial derivatives
Week 10	2-4 Differentiability
Week 11	2-5 Linearization
Week 12	2-6 Differentials
Week 13	2-7 Chain rule
Differential equations	
Week 14	3-1 First order differential equations, variable separable, homogeneous, linear first order.
Week 15	3-2 Non- homogeneous second order with constant coefficients
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	- Thomas Calculus", 12th ED, George B. Thomas Jr., Maurice D. Weir, Joel R. Hass, 2009 - Mathematics For Engineers: A Modern Interactive Approach", 2nd ED, Tony Croft and Robert Davison, 2003.	Yes
Recommended Texts	- Scientific journals and mathematical researches in mathematic their applications	No
Websites	Electronic references, Internet sites, Application of mathematics https://www.cuemath.com/calculus/methods-of-integration/ https://ocw.mit.edu/courses/18-02sc-multivariable-calculus-fall-2010/pages/2.-partial-derivatives/ https://www.khanacademy.org/math/differential-equations	

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	**Workshop**			**Module Delivery**	
Module Type	**Supplementary**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE200**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		1	**Semester of Delivery**		2
Administering Department		-	**College**		-
Module Leader	Mahmood Mohammed Hamzah		**e-mail**	Mmhsh1988@gmail.com	
Module Leader's Acad. Title		Assistant Lecture	**Module Leader's Qualification**		master
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Dr. Omar Riyadh Khaleel	**e-mail**	dr.omaralobaidi@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Apply knowledge and wide-ranging understanding of health, safety and environment principles and legal framework within which the construction industry operates, and undertake full ethical and professional responsibilities in the discharge of their duties. 2. Apply in-depth knowledge and detailed understanding of structural and hydrological analysis, hydraulic design, innovative construction and maintenance techniques to civil engineering infrastructure. 3. Apply innovative and advanced computational methods and simulation tools to model and analyse complex civil engineering and environmental systems. 4. Apply wide-ranging understanding of experimental, analytical and numerical techniques for investigative studies in hydrological, environmental and geotechnical engineering. 5. Apply detailed understanding in proposal development and writing; use innovative knowledge in sourcing, analysing and presenting data; and apply research methodologies to undertake independent investigation and academic writing of a specialized topic. 6. Develop personal abilities in teamwork, leadership and communication. 7. Apply corporate strategy and systems theory to the management of projects in engineering and construction industry.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Acquire knowledge and understanding. 2- To be able subject-specific skills. 3- To be able discussion and dialogue. 4- Brain storming by encouraging students to produce a large number of ideas about some issue or problem raised during the job. 5- Cooperative learning by team working. 6- How to use a range of workshop equipment safely to manufacture components from engineering drawings. 7- Identify the advantages and drawbacks of common manufacturing methods 8- Understand how the design process is affected by manufacturing considerations such as material, cost, time and geometric limitations.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Occupational Safety and importance. [3hrs] • Hand Tools. [3hrs] • Measuring Tools. [3hrs] • Marking-Out and Chisel Cutting. [6hrs] • File Work. [6hrs] • Drilling and Turning and Milling. [12hrs] • Casting and Welding Processes. [9hrs] • Wood Working. [3hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Homework and Assignments. 2. In-Class Questions and Discussions. 4. Extracurricular Activities. 5. Seminars. 6. In- and Out-Class oral conservations. 7. Reports.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction to the basics occupational Safety and importance and importance of safety in life, learning about occupational safety means and practical work
Week 2	Introduction to hand tools, Types of tools, how to use many type of tools, occupational Safety of hand tools and practical work
Week 3	Introduction to measuring Tools, types of measuring tools, how to use vernier caliper and its importance in workshop and practical work
Week 4	What is meaning by Marking-Out; introduction and meaning theory and practical work
Week 5	What is meaning by Chisel Cutting ; introduction and meaning theory and practical work
Week 6	What is meaning by File Working; introduction and meaning theory and practical work
Week 7	Continue practical work
Week 8	Introduction to; Drilling, Turning and Milling; learning about every means
Week 9	practical work
Week 10	practical work
Week 11	practical work
Week 12	What is meaning by Casting and Welding Processes; learning about every means
Week 13	practical work of casting process
Week 14	practical work of welding process
Week 15	Wood Working importance and means and practical work

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Lab 1: occupational Safety in workshop
Week 2	Lab 2: how to use some types of hand tools
Week 3	Lab 3: how to use some types of measuring Tools
Week 4	Lab 4: Marking-Out; tools and technique
Week 5	Lab 5: how to cutting by Chisel
Week 6	Lab 6: making a model sample by file work
Week 7	Lab 7: completing the model sample

Week 8	Lab 8:operating the drilling machine and its uses: practical exercises
Week 9	Lab 9: operating the turning machine and its uses: practical exercises
Week 10	Lab 10: operating the milling machine and its uses: practical exercises
Week 11	Lab 11: making a model sample by casting
Week 12	Lab 12: An exercise about welding two pieces ; butt joint
Week 13	Lab 13: making a model sample by wood working

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. General Engineering Workshop Practice - third edition 1963 Reference Book	No
Recommended Texts	2. Engineering Workshop Data. A Book of Reference containing Data, Formulae, Tables, hints and Recipes relating to all Phases of Engineering Workshop Practice. Hardcover – 1 Jan. 1947.	No
Websites	https://www.slideshare.net/JosephKonnully/workshop-practise	

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	**Computer Programming**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE300**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	-		**College**	-	
Module Leader	Ahmed Younus Yousuf		**e-mail**	Ahmedyounusyousif@aliraqia.edu.iq	
Module Leader's Acad. Title	lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Mostafa Waleed		**e-mail**	mostafa.waleed@aliraqia.edu.iq	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1- Identify the hardware components of a computer system and explore various programming languages. 2- Acquire an introductory understanding of the fundamental principles and techniques involved in programming with MATLAB. 3- Create algorithms and code solutions for a variety of problems. 4- Build and interconnect multiple programs, utilizing various functions to achieve desired outcomes. 5- Demonstrate proficiency in programming complex process problems and developing corresponding code.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Develop proficiency in at least one programming language, including the ability to write, debug, and test code to solve problems. 2- Understand the principles of programming, including variables, data types, control structures, functions, and object-oriented programming concepts. 3- Learn how to use programming tools such as integrated development environments (IDEs), version control systems, and debugging tools. 4- Develop skills in problem-solving and algorithmic thinking, including the ability to break down complex problems into smaller, more manageable tasks. 5- Learn how to read and write documentation for code, as well as how to use online resources to find solutions to programming problems. 6- Understand the importance of code quality and best practices, including testing, code review, and refactoring. 7- Gain an understanding of software development processes, including requirements gathering, design, implementation, testing, and maintenance. 8- Develop a portfolio of projects that demonstrate proficiency in programming skills and problem-solving abilities.
Indicative Contents المحتويات الإرشادية	The inductive content of a computer programming subject may include the following: <u>Part A- Introduction to programming</u> • Concepts and terminology. • Basic syntax and semantics of at least one programming language such as Python, Java, or C++. • Using an integrated development environment (IDE) to write, debug, and test code.[10hrs] <u>Part B- Developing problem-solving skills</u> • Breaking down complex problems into smaller, more manageable task. • Using online resources to find solutions to programming problems. • Testing and debugging code to ensure it is working correctly. • Understanding the basics of software development processes. [15hrs]

	Part B- Introduction to data structures • Arrays, linked lists, stacks, and queues. • Algorithms such as searching and sorting. • Basic concepts of database management systems and SQL. • Web development technologies such as HTML, CSS, and JavaScript. • Basic concepts of software engineering and software design patterns. [20hrs]

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Practice coding regularly: Programming is a skill that requires practice to master. Students should practice writing code regularly, even if it's just a few lines at a time. 2- Work on projects: Programming is often best learned by doing. Students should work on projects that challenge them and allow them to apply programming concepts in a practical way. 3- Collaborate with others: Collaborating with other students can help reinforce programming concepts and provide opportunities to learn from others. Pair programming, where two students work together on the same code, is a popular collaboration strategy. 4- Use online resources: There are many online resources available for learning programming, including tutorials, documentation, and forums. Students should take advantage of these resources to supplement their learning. 5- Attend lectures and labs: Attending lectures and labs is important for understanding programming concepts and getting feedback on coding assignments.

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3, 9	LO #1, 2, 3 and 4
	Assignments	2	10% (10)	4, 12	LO # 5, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	14	LO # 8
Summative assessment	Midterm Exam	2hrs	10% (10)	7	LO # 1-8
	Final Exam	2hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to the computer and its components.
Week 2	Learn about the levels of programming languages, including MATLAB
Week 3	Introduction to MATLAB; Overview of MATLAB environment and interface
Week 4	Basic syntax and commands
Week 5	Variables, arrays, and matrices
Week 6	Use of arithmetic and logical operations
Week 7	Conditional statements (if/else)
Week 8	Loops (for/while)
Week 9	Writing programs to solve complex problems
Week 10	Creating 2D; Customizing plots (labels, titles, legends)
Week 11	Creating 3D plots
Week 12	Introduction to Simulink environment
Week 13	Building and simulating models
Week 14	Introduction to GUI development in MATLAB
Week 15	Creating basic GUIs
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Hand-on exercise and project that enforce MATLAB programming concepts
Week 2	Hand-on exercise and project that enforce working with variables
Week 3	Hand-on exercise and project that enforce working with logical operation
Week 4	Hand-on exercise and project that enforce working condition statement
Week 5	Hand-on exercise and project that enforce working with repetition statements
Week 6	Hand-on exercise and project that enforce working with plotting 2D and 3D
Week 7	Hand-on exercise and project that enforce working with Simulink

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- MATLAB Programming Fundamentals, R2021a	No
Recommended Texts	1- Scientific journals and recent research in various applications that deal with MATLAB applications	No
Websites	1- https://www.mathworks.com 2- http://mayankagr.in/images/matlab_tutorial.pdf	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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	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**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE303**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	-		**College**	-	
Module Leader	Dr. Luma Ahmed Aday		**e-mail**	eng.luma00@gmail.com	
Module Leader's Acad. Title	Assistant professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Dr. Omar Riyadh		**e-mail**	dr.omaralobaidi@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Describe the manufacturing of concrete. 2. Provide the student with theoretical concept of the ingredients of concrete and their impact on fresh and hardened properties of concrete. 3. Comprehend the most appropriate methods to mix, handle, cure, place, compact, and evaluate concrete in its fresh and hardened states. 4. Provide basic understanding of objectives of different tests performed on concrete and its constituents. 5. learn the concept of mix design of concrete mixtures. 6. Know the principles of concrete properties. 7. Make a good base about types of concrete and the suitability of using them.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the process of cement manufacturing. 2. Discuss the constituents of concrete and their properties. 3. Carry out different tests on cement paste or mortar, mineral aggregate, concrete in its fresh and hardened state and all tests relevant to the site. And write report and analyses the data of tests and discuss them and draw the conclusions 4. Evaluate the performance of concrete in both fresh and hardened states particularly strength, durability and stability. 5. Design concrete mixtures to achieve the required fresh and hardened properties. 6. Know the appropriate methods to mix, handle, place, compact, and cure concrete and evaluating the durability of concrete under different Extreme Environmental severe.
Indicative Contents المحتويات الإرشادية	<u>Part A- Introduction to concrete and types of concrete</u> • Significance of concrete, Uses of concrete in structure and types of concrete. <u>Part B- Concrete constituents</u> • Cement: manufacturing of cement, Compound composition of Portland Cement, Structure and reactivity of compounds, special types of cement. • Aggregates: Significance, classification, Properties of aggregates and their significant. • Water. [15hrs] • Admixtures: introduction to admixtures; classifications, properties and applications of chemical admixtures and Mineral admixtures in concrete. [6hrs] <u>Part C- Fresh concrete</u> • Workability, workability factors, workability tests, segregation and bleeding. • Quality control in site: Mixing, handling, placing, compaction and curing. <u>Part D- hardened concrete</u> • Strengths of concrete: factors affecting strengths, compressive strength, tensile strength, destructive and non-destructive test of strengths. • Deformation of hardened concrete, stress-strain, Modulus of elasticity. • Dimensional Stability: Shrinkage and creep.

	• Durability of Concrete • Concrete in hot weather. • Concrete in Marine Environment (chloride attack) • Concrete Under Extreme Environmental Conditions. • Acid Attack, sulphate attack • Fire Resistance • Thermal Properties of Concrete. [20hrs] <u>Part E- Mix design of concrete</u> • Introduction to nominal mix. • General Considerations of mix design. • Specific Considerations of mix design • Concrete mix design by ACI Method. • Trial and adjustment of mix proportions. [20hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures will be conducted with the aid of projector, 2. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. 3. Surprise tests/Quizzes/ will be conducted. 4. Assigning students to prepare reports on a particular subject and thus motivate students to learn the initial principles of scientific research. 5. explanation about the experiment procedures given by the lecturer, and thus a chance is available to the student to conclude and analyze the experiment results.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	15% (10)	5, 12	LO #1, 2, 4 and 5
	Projects / Assignment	2	10% (10)	11	LO # 6
	Lab. reports	1	15% (10)	Intermittently (determined by Module leader)	LO # 3
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1,2,4,5 and 6
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction - Significance of concrete, Uses of concrete in structure and types of concrete.
Week 2	Portland cement manufacturing, chemical composition of cement, hydration process of cement, stages of hardening cement, properties of cement, their physical and chemical properties.
Week 3	Aggregates: Significance, classification, Properties of aggregates and their significant.
Week 4	Aggregates: Significance, classification, Properties of aggregates and their significant.
Week 5	-Water in concrete -Admixtures in concrete: introduction to admixtures; classifications, properties and applications of chemical admixtures and Mineral admixtures in concrete.
Week 6	Workability of concrete: workability factors, workability tests, segregation and bleeding and problem of fresh concrete in the site.
Week 7	Workability of concrete: Quality control in site: Mixing, handling, placing, compaction and curing.
Week 8	Hardened Concrete: Strengths of concrete: factors affecting strengths, compressive strength, tensile strength, destructive and non-destructive test of strengths.
Week 9	Mid-term Exam
Week 10	Hardened Concrete: Deformation of hardened concrete, stress-strain, Modulus of elasticity. Dimensional Stability: Shrinkage and creep.
Week 11	Hardened Concrete (Durability of Concrete): Permeability of concrete, Concrete in hot weather, Concrete in Marine Environment (chloride attack), Concrete Under Extreme Environmental Conditions.

Week 12	Hardened Concrete (Durability of Concrete): Acid Attack, sulphate attack, Fire Resistance, Thermal and acoustic Properties of Concrete
Week 13	Concrete mix design, Basic considerations (General Considerations of mix design and Specific Considerations of mix design) and choice a mix proportion
Week 14	various methods of mix designs including ACI Code method and Trial and adjustment of mix proportions
Week 15	Recap and **Preparatory week before the final Exam**
Week 16	Final Exams

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Fineness Test of cement and specific gravity test of cement
Week 2	Standard Consistence Test
Week 3	Setting Time Test of cement
Week4	Compressive Strength of Cement Mortars
Week5	Aggregate Sampling
Week6	Sieve Analysis of Aggregates,
Week 7	Specific Gravity, Absorption test for aggregate and Determination of Organic Impurities
Week 8	Workability test: slump test, V-bee test, Compacting Factor Test and fresh density of concrete
Week9	Destructive tests: compressive strength, splitting tensile strength and flexural strength test
Week 10	None-destructive tests: Schmidt hammer test, ultra-pulse velocity, hardened density, Rapid Chloride Permeability test, Initial Surface Absorption Test (ISAT) and water absorption tests.
Week 11	Destructive tests: compressive strength, splitting tensile strength and flexural strength test
Week 12	None-destructive tests: Schmidt hammer test, ultra-pulse velocity, hardened density, Rapid Chloride Permeability test, Initial Surface Absorption Test (ISAT) and water absorption tests.
Week1 3	Destructive tests: compressive strength, splitting tensile strength and flexural strength test
Week 14	None-destructive tests: Schmidt hammer test, ultra-pulse velocity, hardened density, Rapid Chloride Permeability test, Initial Surface Absorption Test (ISAT) and water absorption tests.
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. A.M. Neville, J.J. Brook, Concrete Technology, International Students' Edition 2. M. S. Shetty, Concrete Technology: Theory and Practice, S. Chand, New Delhi, 2015 3. P.K. Mehta, Paulo j. M. Monteiro, Concrete, Microstructure, Properties and Materials, University of California, Berkley (Indian Edition)	NO
Recommended Texts	1. ACI (American concrete institute), ASTM (American standards for testing methods) 2. BS (British standards) 3. I.Q.S(Iraqi standard specifications)	NO
Websites	https://theconstructor.org/concrete/concrete-mix-design-calculation-procedure-example-m20-m25-m30/13020/	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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	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
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	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**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE303**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	-		**College**	-	
Module Leader	Dr. Luma Ahmed Aday		**e-mail**	eng.luma00@gmail.com	
Module Leader's Acad. Title	Assistant professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Dr. Omar Riyadh		**e-mail**	dr.omaralobaidi@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Describe the manufacturing of concrete. 2. Provide the student with theoretical concept of the ingredients of concrete and their impact on fresh and hardened properties of concrete. 3. Comprehend the most appropriate methods to mix, handle, cure, place, compact, and evaluate concrete in its fresh and hardened states. 4. Provide basic understanding of objectives of different tests performed on concrete and its constituents. 5. learn the concept of mix design of concrete mixtures. 6. Know the principles of concrete properties. 7. Make a good base about types of concrete and the suitability of using them.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the process of cement manufacturing. 2. Discuss the constituents of concrete and their properties. 3. Carry out different tests on cement paste or mortar, mineral aggregate, concrete in its fresh and hardened state and all tests relevant to the site. And write report and analyses the data of tests and discuss them and draw the conclusions 4. Evaluate the performance of concrete in both fresh and hardened states particularly strength, durability and stability. 5. Design concrete mixtures to achieve the required fresh and hardened properties. 6. Know the appropriate methods to mix, handle, place, compact, and cure concrete and evaluating the durability of concrete under different Extreme Environmental severe.
Indicative Contents المحتويات الإرشادية	<u>Part A- Introduction to concrete and types of concrete</u> • Significance of concrete, Uses of concrete in structure and types of concrete. <u>Part B- Concrete constituents</u> • Cement: manufacturing of cement, Compound composition of Portland Cement, Structure and reactivity of compounds, special types of cement. • Aggregates: Significance, classification, Properties of aggregates and their significant. • Water. [15hrs] • Admixtures: introduction to admixtures; classifications, properties and applications of chemical admixtures and Mineral admixtures in concrete. [6hrs] <u>Part C- Fresh concrete</u> • Workability, workability factors, workability tests, segregation and bleeding. • Quality control in site: Mixing, handling, placing, compaction and curing. <u>Part D- hardened concrete</u> • Strengths of concrete: factors affecting strengths, compressive strength, tensile strength, destructive and non-destructive test of strengths. • Deformation of hardened concrete, stress-strain, Modulus of elasticity. • Dimensional Stability: Shrinkage and creep.

	• Durability of Concrete • Concrete in hot weather. • Concrete in Marine Environment (chloride attack) • Concrete Under Extreme Environmental Conditions. • Acid Attack, sulphate attack • Fire Resistance • Thermal Properties of Concrete. [20hrs] <u>Part E- Mix design of concrete</u> • Introduction to nominal mix. • General Considerations of mix design. • Specific Considerations of mix design • Concrete mix design by ACI Method. • Trial and adjustment of mix proportions. [20hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures will be conducted with the aid of projector, 2. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. 3. Surprise tests/Quizzes/ will be conducted. 4. Assigning students to prepare reports on a particular subject and thus motivate students to learn the initial principles of scientific research. 5. explanation about the experiment procedures given by the lecturer, and thus a chance is available to the student to conclude and analyze the experiment results.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	15% (10)	5, 12	LO #1, 2, 4 and 5
	Projects / Assignment	2	10% (10)	11	LO # 6
	Lab. reports	1	15% (10)	Intermittently (determined by Module leader)	LO # 3
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1,2,4,5 and 6
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction - Significance of concrete, Uses of concrete in structure and types of concrete.
Week 2	Portland cement manufacturing, chemical composition of cement, hydration process of cement, stages of hardening cement, properties of cement, their physical and chemical properties.
Week 3	Aggregates: Significance, classification, Properties of aggregates and their significant.
Week 4	Aggregates: Significance, classification, Properties of aggregates and their significant.
Week 5	-Water in concrete -Admixtures in concrete: introduction to admixtures; classifications, properties and applications of chemical admixtures and Mineral admixtures in concrete.
Week 6	Workability of concrete: workability factors, workability tests, segregation and bleeding and problem of fresh concrete in the site.
Week 7	Workability of concrete: Quality control in site: Mixing, handling, placing, compaction and curing.
Week 8	Hardened Concrete: Strengths of concrete: factors affecting strengths, compressive strength, tensile strength, destructive and non-destructive test of strengths.
Week 9	Mid-term Exam
Week 10	Hardened Concrete: Deformation of hardened concrete, stress-strain, Modulus of elasticity. Dimensional Stability: Shrinkage and creep.
Week 11	Hardened Concrete (Durability of Concrete): Permeability of concrete, Concrete in hot weather, Concrete in Marine Environment (chloride attack), Concrete Under Extreme Environmental Conditions.

Week 12	Hardened Concrete (Durability of Concrete): Acid Attack, sulphate attack, Fire Resistance, Thermal and acoustic Properties of Concrete
Week 13	Concrete mix design, Basic considerations (General Considerations of mix design and Specific Considerations of mix design) and choice a mix proportion
Week 14	various methods of mix designs including ACI Code method and Trial and adjustment of mix proportions
Week 15	Recap and **Preparatory week before the final Exam**
Week 16	Final Exams

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Fineness Test of cement and specific gravity test of cement
Week 2	Standard Consistence Test
Week 3	Setting Time Test of cement
Week4	Compressive Strength of Cement Mortars
Week5	Aggregate Sampling
Week6	Sieve Analysis of Aggregates,
Week 7	Specific Gravity, Absorption test for aggregate and Determination of Organic Impurities
Week 8	Workability test: slump test, V-bee test, Compacting Factor Test and fresh density of concrete
Week9	Destructive tests: compressive strength, splitting tensile strength and flexural strength test
Week 10	None-destructive tests: Schmidt hammer test, ultra-pulse velocity, hardened density, Rapid Chloride Permeability test, Initial Surface Absorption Test (ISAT) and water absorption tests.
Week 11	Destructive tests: compressive strength, splitting tensile strength and flexural strength test
Week 12	None-destructive tests: Schmidt hammer test, ultra-pulse velocity, hardened density, Rapid Chloride Permeability test, Initial Surface Absorption Test (ISAT) and water absorption tests.
Week1 3	Destructive tests: compressive strength, splitting tensile strength and flexural strength test
Week 14	None-destructive tests: Schmidt hammer test, ultra-pulse velocity, hardened density, Rapid Chloride Permeability test, Initial Surface Absorption Test (ISAT) and water absorption tests.
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. A.M. Neville, J.J. Brook, Concrete Technology, International Students' Edition 2. M. S. Shetty, Concrete Technology: Theory and Practice, S. Chand, New Delhi, 2015 3. P.K. Mehta, Paulo j. M. Monteiro, Concrete, Microstructure, Properties and Materials, University of California, Berkley (Indian Edition)	NO
Recommended Texts	1. ACI (American concrete institute), ASTM (American standards for testing methods) 2. BS (British standards) 3. I.Q.S(Iraqi standard specifications)	NO
Websites	https://theconstructor.org/concrete/concrete-mix-design-calculation-procedure-example-m20-m25-m30/13020/	

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	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE304**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		2	**Semester of Delivery**		3
Administering Department		-	**College**	-	
Module Leader	Mahmood Mohammed Hamzah		**e-mail**	mmhsh1988@gmail.com	
Module Leader's Acad. Title		Asst.Lec.	**Module Leader's Qualification**		Master
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Dr. Ahmed Khalef	**e-mail**	ahmed.khalaf34@gmail.com	
Scientific Committee Approval Date		15/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The objective of this course is to provide an elementary, but rigorous mathematical presentation of continuum description, to introduce concepts and basic principles of fluid mechanics. In particular, the aim is to introduce tensors and elements of tensor algebra, governing equations and their application to modelling and solution of representative fluid mechanical problems relevant to industry and environment, to show various mathematical approaches and assumptions commonly used in the analysis of liquid flows. The module has been developed for students who have little or no experience in fluid mechanics
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Know, understand and apply the basic concepts of Fluid Mechanics to carry out professional engineering activities in the field of fluids. 2- Apply scientific method strategies to fluid mechanics: analyze qualitatively and quantitatively the problem situation, propose hypotheses and solutions. 3- Use specific vocabulary and terminology and the appropriate means to effectively communicate knowledge, procedures, results, skills and aspects inherent to fluid mechanics. 4- Work efficiently in a group, integrating skills and knowledge to make decisions in the performance of fluid mechanics tasks, adopting a responsible and organized attitude to work and a willingness to learn. 5- Plan and carry out designs and processes in the field of fluid mechanics in accordance with the relevant specific technology, applying the quality principles and methods and analyzing and assessing the social and environmental impact of the technical solutions adopted. 6- Cooperative learning by team working.
Indicative Contents المحتويات الإرشادية	<u>Introduction & Definition of a Fluid</u> • Dimensions & Units. • Fluid Properties. • Fluid Statics & Applications. [8hrs] <u>Concepts of System & Control Volume Approach & Applications</u> • Bernoulli-Energy Equation & Applications. • Momentum Equation & Applications. • Viscous Effects-Fluid Resistance. • Laminar & Turbulent Flow. • Shear & Velocity Distributions. • Flow in Closed Conduits& Applications. • Drag Force on Immersed Bodies. • Dimensional Analysis & Similitude. • Friction and Minor Losses in Pipes. • Steady Flow in Open Channels. [53hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Tutorials 2- Homework and Assignment. 3- Test and Exams. 4- In class Question and Discussion. 5- Reports, Presentation and Posters

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction
Week 2	Fluid Properties

Week 3	Definition of a Fluid
Week 4	Dimensions & Units
Week 5	Fluid Statics & Applications
Week 6	Concepts of System
Week 7	Bernoulli-Energy Equation & Applications
Week 8	Momentum Equation & Applications
Week 9	Viscous Effects-Fluid Resistance
Week 10	Laminar & Turbulent Flow
Week 11	Shear & Velocity Distributions
Week 12	Drag Force on Immersed
Week 13	Dimensional Analysis & Similitude Bodies
Week 14	Friction and Minor Losses in Pipes
Week 15	Steady Flow in Open Channels
Week 16	Final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Lab 1: An introductory lecture about the laboratory
Week 2	Lab 1: Tools Measurements
Week 5	Lab 2: Reynolds Apparatus
Week 6	Lab 3: Continue
Week 7	Lab 4: Bernoulli Apparatus
Week 8	Lab 5: Continue
Week 11	Lab 6: Flow Measurement
Week 12	Lab 6: Continue
Week 13	Lab 7: Hydrostatic Pressure
Week 14	Lab 7: Continue

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Y.A. Cengel J.M. Cimbala, Fluid Mechanics (Fundamentals and Applications), McGraw-Hill, latest edition. 2. F.M. White, Fluid Mechanics, McGraw-Hill, latest edition. 3. J.F. Douglas, J.M. Gasiorek and J.A. Swaffield, Fluid Mechanics, Pearson, latest edition	Yes
Recommended Texts	1. M.C. Potter, and D.C. Wiggert, Mechanics of Fluids, Prentice-Hall, latest edition.	No
Websites	https://www.britannica.com/science/fluid-mechanics	

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	**Mechanics of Materials I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE301**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		2	**Semester of Delivery**		3
Administering Department			**College**		
Module Leader	Wael Raad		**e-mail**	ogaidiwael@gmail.com	
Module Leader's Acad. Title		Assistant lecturer	**Module Leader's Qualification**		Msc
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Yasir Wisam	**e-mail**	yasiraliris@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Engineering Mechanics I&II	**Semester**	1,2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Review some of the important principles of statics and show how they are used to determine the internal resultant loadings in a body. 2. Introduce the concept of normal and shear stress. 3. Analysis and design a member subjected to axial load or direct shear 4. Define the quantities of deformation of a body using the concept of normal and shear strain. 5. Show how stress can be related to strain by using experimental methods. 6. Discuss the mechanical properties, and other tests that are related to the development of mechanics of materials. 7. Discuss how to determine the deformation of the axially loaded members. 8. An analysis of the effects of thermal stress. 9. Determine the stress in beams and shafts caused by bending. And calculate the maximum bending stress. 10. Develop a method for finding the shear stress in a beam having a prismatic cross section and made from homogeneous material that behaves in a linear-elastic manner.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the distinction between internal and external forces. 2. Learn the concepts of stress, strain at a point, and their relationships in different material types and different loads. 3. Acknowledge the characterization of mechanical properties of materials to solve problems. 4. Calculate the deformation in axially loaded members, and develop a method for finding the support reactions when these reactions cannot be determined strictly from the equations of equilibrium. And analyze the effects of thermal stress. 5. Learn how to draw the shear and moment diagrams provide a useful means for determining the largest shear and moment in a member, and specify where these maximums occur, for straight beams and special cases like unsymmetric bending or sections. 6. Calculate the bending stresses developed in beams and shafts by the bending loading and draw the stress distribution along the beam cross section. 7. Understand a method of analysis to calculate the shear stresses, and discuss the concept of shear flow along with shear stress for beams and thin-walled members.
Indicative Contents المحتويات الإرشادية	1. Simple stresses: Internal resultant forcing (normal, shear, bending, torsion), normal stress, shear stress, allowable stresses. [16 hrs] 2. Strain: normal strain, and shear strain. [4 hrs] 3. Mechanical properties: the tension and compression test, stress-strain diagram (conventional and true diagram), ductile and brittle materials, Hook's

	law, strain hardening, Poisson's ratio, shear stress – strain diagram, fatigue and creep. [4 hrs] 4. Axial loads: elastic deformation of axially loaded members, deformation formula, statically indeterminate axially loaded members, thermal stresses. [4 hrs] 5. bending: shear and moment diagram (section and graphical methods), flexural formula, unsymmetrical bending and moments, composite beams. [16 hrs] 6. transverse shear: shear in straight members, the shear formula, shear flow, built-up members, and thin-walled members.

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	112	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	15% (15)	4, 5, 12	LO # 1, 2, 4, and 6
	Assignments	2	15% (15)	8, 15	LO # 5, and 7
	Projects	1	10% (10)	Continuous	LO # 3
	Report	0	0	-	-
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-4
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Review some of the important principles of statics and show how they are used to determine the internal resultant loadings in a body.
Week 2	Introduce the concept of normal stress.
Week 3	Introduce the concept of shear stress.
Week 4	Analysis and design of a member subjected to axial load or direct shear.
Week 5	Define the quantities of deformation of a body using the concept of normal and shear strain.
Week 6	Discuss the mechanical properties and other tests that are related to the development of the mechanics of materials. And show how stress can be related to strain by using experimental methods. Learn the analysis of thermal effects.
Week 7	Mid-term exam
Week 8	Learn how to calculate the axial deformation and solve statically indeterminate members.
Week 9	Learn how to draw the shear and moment diagrams using the section method.
Week 10	Learn how to draw the shear and moment diagrams using the graphical method
Week 11	Calculate the bending stresses developed in beams and shafts by the bending loading.
Week 12	Calculate the bending stresses developed in unsymmetrical beams and composite beams.
Week 13	Understand a method of analysis to calculate the shear stresses
Week 14	Determine the shear flow in built-up beams and members
Week 15	Determine the shear flow in thin-walled beams and members
Week 16	**A preparatory week before the Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Mechanics of Materials, 9th ed. , R.C Hibbeler	Yes
Recommended Texts	2. Strength of Materials 4th ed., Singer and Pytel	No
Websites	3. https://www.udemy.com/course/mechanics-of-materials-sgt/	

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	**Probability and Statistics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE305**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	-		**College**	-	
Module Leader	Saba Raad		**e-mail**	Sabaraaad86@gmail.com	
Module Leader's Acad. Title	Asst.lec		**Module Leader's Qualification**	M.S.C	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Ibtihaj Abdulwahhab		**e-mail**	ibtihaj.abdulwahhab@aliraqia.edu.iq	
Scientific Committee Approval Date	15/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Identify the types of Frequency tables and draw them Graphically. 2. Using statistical methods (Measures of Central Tendency, Measures of Dispersion) to identify the data . 3. Apply the rules of probability . 4. Solve discrete probability distribution problems . 5. Solve Continuous probability distribution problems . 6. Find correlation and regression for data .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Organizes the data into frequency distribution tables 2. Determine a value to represent a data set using a measure of central tendency. 3. Determine a value to represent a data set using a measure of dispersion. 4. Apply the rules of probability. 5. Calculate Binomial distributions. 6. Calculate poison distributions. 7. Calculate standard normal "z" distributions by table of values Probability p(Z) 8. Calculate student "t" distributions by table of values Probability $t_{(1-\propto,\nu)}$ 9. find Pearson correlation coefficient. 10. find spearman correlation coefficient. 11. find simple linear regression equation. 12. find linear equation by least square method.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Statistics :</u> General Introduction - Statistics and methods of collecting data and organizing them in tables - Frequency Distributions: Proportionate" f^* " , Upper Cumulative"F" , Lower Cumulative"$F^{\backslash}$ " - The Graphical Representation of the Distributions . [6 hrs] Measures of Central Tendency (Classified Data \ Unclassified Data): Mean "M", Median"Me" , Mode"Mo" - Measures of Dispersion (Classified Data \ Unclassified Data): Range"R" , Variance"S^2" , Standard Deviation"S" , Mean Deviation"MD" . [8 hrs] <u>Part B – Probability</u> Probability rules : Union , Intersection - Conditional probability , independent event - Discrete Probability Distribution: Binomial , Poisson - Continuous Probability Distribution: Normal "Z", Student " t " . [8 hrs] Correlation :(Pearson \ Spearman) correlation coefficient - regression :simple linear regression equation, least square method . [4 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Part A – Statistics Brainstorm strategy: Where we present a problem to the students and study their suggestions and opinions to reach the most appropriate solution to the question Peer education strategy: The teacher gives a quick explanation of the subject and then takes the role of the student teacher to explain the subject to his classmates Part B – Probability inductive method : as we begin by writing the general law and its explanation, then applying it in practice to various examples

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	43	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	32	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	7, 13	LO #2, 3, 5 and 6
	Assignments	1	10% (10)	9	LO #7 and 8
	Report	1	10% (10)	10	LO #11 and 12
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8,15	LO # 1-3 and 4-12
	Final Exam	3hr	50% (50)	16	All
			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General Introduction - Statistics and methods of collecting data and organizing them in tables
Week 2	Frequency Distributions: Proportionate ,Upper Cumulative , Lower Cumulative
Week 3	The Graphical Representation of the Distributions
Week 4	Measures of Central Tendency (Classified Data): Mean , Median , Mode
Week 5	Measures of Central Tendency (Unclassified Data): Mean , Median , Mode
Week 6	Measures of Dispersion (Classified Data): Range , Variance , Standard Deviation , Mean Deviation
Week 7	Measures of Dispersion (Unclassified Data): Range , Variance , Standard Deviation , Mean Deviation
Week 8	Probability : Union , Intersection
Week 9	Discrete Probability Distribution: Binomial
Week 10	Discrete Probability Distribution: Poisson
Week 11	Continuous Probability Distribution: Normal , Student " t "
Week 12	Correlation : Pearson
Week 13	Correlation : Spearman
Week 14	Regression : Simple Linear
Week 15	Regression : Least Square Method
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• المشهداني,محمود وهرمز,امير (1989): الاحصاء,المكتبة الوطنية,العراق. • عمارة،نعمة وتوفيق,سحر(1989): الاحصاء وتطبيقاته الهندسية, الجامعة التكنولوجية،العراق.	No
Recommended Texts	• Statistics ,fourth edition, Murray R. Spiegel, Larry J. Stephens .	No
Websites	https://www.khanacademy.org/math/statistics-probability	

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	**Building Construction**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE403**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		2	**Semester of Delivery**		4
Administering Department		-	**College**	-	
Module Leader	Dr.Luma Ahmed Aday		**e-mail**	eng.luma00@gmail.com	
Module Leader's Acad. Title		Assistant professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Dr.Mohanad Hatem	**e-mail**	mohshadhar@hmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Familiarizing students with building systems and its various elements. 2. Study implementation mechanisms and supervision of the construction phases of the structural (primary) and various which include (foundations, walls, floors, stairs and others. 3. Knowledge of different materials to build and understand the composition of the Executive and requirements, and to identify the different characteristics and how to use them. 4. Identify local building materials in terms of their location and mechanisms manufactured various forms. 5. Drawing and show the shop drawings.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify components of building structures. 2. Propose suitable type of foundation for building structures. 3. Select suitable type of masonry for building structures. 4. Explain different types of walls, scaffolding, shoring, underpinning and their constructional methodology 5. Carry out the construction of brick wall. 6. Supervise rubble and ashlar types of stone masonry construction 7. Evaluate the possible reason of dampness at various level in building and remedial means 8. Select different types of doors, windows, floors and stairs cases in building 9. Select the relevant material for finishing works. 10. Execute safe practices in building construction activities.
Indicative Contents المحتويات الإرشادية	<u>Part A-Introduction</u> • Introduction to course, why construction techniques are important vis a vis building designing. • Site Works and Setting Out. • Clearing of site & building layout. Cement - Manufacturing of cement, Compound composition of Portland Cement, Structure and reactivity of compounds. • Excavation: Requirement for excavation. [8hrs] <u>Part B- Foundations and their types</u> • Types, functions, characteristics. • Selection of foundations, viz. strip, combined, cantilever and raft foundations. • Deep foundation types as per distribution of load and materials for construction. • Types of materials used in construction of piles. [10hrs] <u>Part C- Damp Protection</u> • Sources and cause of dampness, defects of dampness. • Methods of damp proofing, damp proof courses, materials used for damp protections. • Selection of appropriate DPC materials for different parts of building. • Floor Structures.

	• Introduction to floors, types and materials of construction. • Ground floors. • Upper floors. • Timber floors • RCC floors. • Floor finishes. [16hrs] <u>Part C- Masonry wall</u> • Introduction to wall types, materials and mortars used. • Stone masonry. • Brick masonry. • Concrete block masonry. [11hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures will be conducted with the aid of projector, 2. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. 3. Surprise tests/Quizzes will be conducted. 4. Assigning students to prepare reports on a particular subject and thus motivate students to learn the initial principles of scientific research. 5. Field examples are often made and students are encouraged to make field visits

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	15% (15)	2, 11	LO #1and 2
	Assignments	2	10% (10)	3, 10	LO # 6 ,8 and 10
	Report	1	10% (10)	5	LO # 3,4 and 5
Summative assessment	**Midterm Exam**	2 hr	15% (15)	8	LO # 1-6
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview of Building components
Week 2	Foundation, Types of foundations
Week 3	Stone Masonry
Week 4	Brick masonry
Week 5	Bonds in brick masonry- header bond, stretcher bond, English bond and Flemish bond
Week 6	Scaffolding and types of Scaffolding
Week 7	Definition of Form work, Requirements of Formwork, Materials used in Formwork
Week 8	Mid-term Exam
Week 9	Introduction to floors, types and materials of construction
Week 10	Types of Stairs
Week 11	Settlement of Foundation: Types, Causes and Remedial measures
Week 12	Water Proofing: Necessity and importance, material used for Water Proofing,
Week 13	Beams and Columns
Week 14	Windows: Component of windows, Types of Windows
Week 15	Doors: Components of Doors
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Varghese PC. Building construction. PHI Learning Pvt. Ltd.; 2016 Dec 1. 2. Construction of Buildings (Volumes 1 to 5) by R.Barry 7th edition	NO
Recommended Texts	1. Building Materials And Construction, Sushil Kumar, Bindra, Kamala.	No
Websites	https://ww3.rics.org/uk/en/journals/construction-journal/how-site-experience-supports-student-learning.html	

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 Management & Economics**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UICE404**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	-		**College**	-	
Module Leader	Saja Hadi Raheem		**e-mail**	Sajahadi22@gmail.com	
Module Leader's Acad. Title	Lecture.Doctor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Dr.Salam J. Bash		**e-mail**	salambash2000@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Engineering Economy : 1. Understand the types of questions engineering economy can answer. 2. Determine the role of engineering economy in the decision-making process. 3. Identify what is needed to successfully perform an engineering economy study. 4. Perform calculations about interest rates and rate of return. 5. Understand what equivalence means in economic terms. 6. Calculate simple interest and compound interest for one or more interest periods. 7. Identify and use engineering economy terminology and symbols. Engineering Management: 1. Students will learn primary engineering systems. 2. Students will learn primary engineering methods and materials. 3. Students will develop engineering cost accounting, management and control knowledge and skills. 4. Students will learn engineering project management and control systems. 5. Students will understand professional ethical responsibility. 6. Students will learn to function as a member of a team. 7. Students will learn to communicate effectively. 8. Students will learn to apply mathematic skills to solve construction problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. An ability to select and apply the knowledge, technique, skills, and modern tools of the discipline to broadly-defined engineering management activities; 2. An ability to select and apply knowledge of mathematics, science, business, management, construction and construction science to problems that require the application of engineering management principles and applied procedures or methodologies. 3. An ability to identify, sequence, schedule, and estimate the costs of critical construction activities as associated with successful construction proposals. 4. The ability to display fundamental knowledge of critical aspects of the body of knowledge expected of constructors entering the engineering management profession. 5. An ability to function effectively as a member or leader on a engineering team. 6. An ability to identify, analyze and solve broadly-defined engineering problems. 7. An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature. 8. An understanding of the need for an ability to engage in self-directed continuing professional development. 9. A knowledge of the impact of construction in a societal and global context; and 10. A commitment to cost-effectiveness, quality, timeliness and continuous improvement.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Fundamentals of Engineering management</u>

	Concept of engineering management (EM), Introduction to project management, understanding the function of engineering management. [6 hrs.] Understanding construction planning techniques by using bar chart [3 hrs.], Understanding Critical Path Methods (Arrow Diagram, Precedence Networks, Overlapped Precedence Networks, PERT Technique) [12 hrs]. Projects Planning Technique Using line of balance Technique, and project scheduling [6 hrs.] Part B –Applications of Engineering Economy Concepts: Introduction to quality control, Statistical quality control, Control charts and Types of control chart. [6 hrs.] Linear Programing, Definition of linear programming (LP),Transportation problems, and review what was presented during the course through a set of examples [9 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Tutorials. 2. Homework and Assignments. 3. Tests and Exams. 4. In-Class Questions and Discussions. 5. Connection between Theory and Application. 6. Extracurricular Activities. 7. In- and Out-Class oral conservations. 8. Reports.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4 and 9	LO #1-2, and 3
	Assignments	2	10% (10)	3, 12	LO # 3-5
	Attendance	15	10% (10)	Continuous	ALL
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction**;** Concept of engineering management (EM)
Week 2	Engineering management functions and role, the function of engineering management
Week 3	Construction planning techniques; Bar chart technique
Week 4	Critical path method; Arrow diagram
Week 5	Critical path method; Precedence network
Week 6	Critical path method; Overlapped precedence network
Week 7	Mid-term Exam + Revision problems
Week 8	Critical path method, Pert technique
Week 9	Projects Planning Technique Using line of balance Technique
Week 10	Projects Scheduling; Time-Cost Relationship
Week 11	Statistical Quality Control (SQC); Quality Management
Week 12	Statistical Quality Control (SQC); Statistical quality control, control charts, types of control chart
Week 13	Linear Programing and Operation Research; definition of linear programing (LP)
Week 14	Linear Programing and Operation Research; Transportation problems
Week 15	Review (what was presented during this course). Provide a set of examples
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Khan, Mohammad Ibrahim. Industrial engineering. New Age International, 2004.	Yes
Recommended Texts	1. Vaughn, Richard C. Introduction to industrial engineering. Iowa State Pr, 1985. 2. Zuriarrain, Amador. "Maynard, HB: Manual de Ingeniería de la Producción Industrial (Book Review)." Boletín de Estudios Económicos 17 (1962): 646. Joseph C. Hartman, "Engineering Economy and the Decision Making Process" Prentice Hall, 2007	No
Websites	https://www.uoanbar.edu.iq/eStoreImages/Bank/6298.pdf.	

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 Mathematics**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE405**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	-		**College**	-	
Module Leader	Ishraq Hameed Naser		**e-mail**	hameedishraq@yahoo.com	
Module Leader's Acad. Title	lecturer		**Module Leader's Qualification**	MSC	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Saba Raad		**e-mail**	sabaaa043@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of many subjects in engineering mathematics and applications for civil engineering problems. 2. To model civil engineering problems as first, second and higher differential equations. 3. To solve system of differential equations such as Un damped vibration of cabled system; and Multi_ degree of freedom system 4. This course deals with the basic concept of Fourier Series. 5. To understand Laplace transforms and inverse Laplace transform problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how mathematics work for engineering applications. 2. List the various methods for solving ordinary and partial differential equation. 3. Modeling an engineering problem as a differential equation. 4. Solving Fourier series problems. 5. Applying – Application in Mechanical Vibration. 6. Discuss the solution in Mechanical Vibration. 7. Applying the Solutions of one dimensional wave equation 8. Applying the Solutions of one dimensional heat equation 9. Solving Power Series Solutions of differential Equations
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Introduction and Applications Ordinary Differential equation</u> Second order differential equation; Higher order differential equation. [9hrs] <u>Part B – 2nd and higher ODEs and applications</u> Un damped vibration of beam; Buckling of slender column [6hrs] <u>Part C – system of differential equations</u> Un damped vibration of cabled system; and Multi_ degree of freedom system [6hrs] <u>Part D – Fourier Series</u> Fundamentals, odd and even functions, Fourier Series and half range problem [6hrs] <u>Part E – Application in Mechanical Vibration</u> Partial differential Equations and Boundary value Problems; One Dimensional wave equation; Torsion Vibration of circular shaft; Two dimensional wave equation; Three dimensional heat equation. [8hrs] <u>Part F – solution in Mechanical Vibration</u> Solutions of one dimensional wave equation; Solutions of one dimensional heat equation; Power Series Solutions of differential Equations. [12hrs]

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	4, 8	LO #1, 2, and 5
	Assignments	2	10% (10)	5, 12	LO # 3, 4, 6 and 7
	Report	1	10% (10)	13	LO # 5, 8 and 9
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction and Applications Ordinary Differential equation: Second order differential equation; Higher order differential equation.
Week 2	2nd and higher ODEs and applications: Un damped vibration of beam
Week 3	2nd and higher ODEs and applications; Buckling of slender column
Week 4	system of differential equations: Un damped vibration of cabled system
Week 5	system of differential equations: Multi_ degree of freedom system

Week 6	Fourier Series; Fundamentals, odd and even functions
Week 7	Fourier Series and half range problem
Week 8	Application in Mechanical Vibration: Partial differential Equations and Boundary value Problems
Week 9	One Dimensional wave equation
Week 10	Torsion Vibration of circular shaft
Week 11	Two-dimensional wave equation
Week 12	Three-dimensional heat equation
Week 13	Solutions of one-dimensional wave equation
Week 14	Solutions of one-dimensional heat equation
Week 15	Power Series Solutions of differential Equations
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Courant R, John F, Blank AA, Solomon A. Introduction to calculus and analysis. New York: Interscience Publishers; 1965 Jan. 2. Erwin Kreyszig, (2011), Advanced Engineering Mathematics, Book, 10th Edition. 3. Stephen L. Campbell and Richard Haberman, Introduction to Differential Equations with Dynamical Systems .	Yes
Recommended Texts	1. Paul Blanchard, Robert L. Devaney, and Glen R. Hall (2011) Differential Equations, Book, 4th Edition. 2. William E. Boyce and Richard C. DiPrima, (2001) Elementary Differential Equations and Boundary Value Problems, Book, 7th Edition.	No
Websites	1. https://www.sciencedirect.com/book/9780128097304/engineering-mathematics-with-examples-and-applications 2. https://www.geeksforgeeks.org/engineering-mathematics-tutorials/	

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 Surveying II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE400**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	-		**College**	-	
Module Leader	Name: Hiba Akram		**e-mail**	Hiba.akram.at@gmail.com	
Module Leader's Acad. Title	Asst.Lecturer		**Module Leader's Qualification**	M.Sc	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Dr. Mohammed Hadi		e-mail	mohammed.h.nahi@aliraqia.edu.iq	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Engineering surveying I	**Semester**	3
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Explain direction, azimuth bearing, and magnetic declination. 2. Teaching them how to measure the horizontal and vertical angles and how to compute the unknown elevations and height of building. 3. Explain what the coordinate and traversing using theodolite instrument. 4. Explain the topographic map, contour line. 5. To teach them about GPS and EDM applications to determine apposition. 6. Explain about GIS application to record information on the map.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Solve mathematical problems using algebraic and trigonometric functions. 2. To learn to work as a team, ethics and prepare technical reports of surveying. 3. To relate theoretical knowledge of surveying to resolve real field problems. 4. Measuring directions (azimuth and bearing) and convert between them. 5. Ability to measure horizontal and vertical angle to compute the elevations of unknown points and compute the height of building. 6. Perform calculations of land areas of earth work given suitable data. 7. Determine the plane position and coordinate of points using arrange of surveying techniques. 8. Understand and use various methods of control surveying including traversing 9. Ability read and use topographic maps and draw contour lines. 10. Knowledge about how satellites position objects on and above surface of the earth. 11. Analyze spatial data using GIS, and analyze toots to record information on the map.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction, Directions (Azimuth, Bearing), types of meridians, magnetic declination, computing directions, Angle measurement, accuracy of angle measurement. [15 hrs] Theodolite (component of an electronic theodolite and mechanical part of theodolite), Horizontal angle (repetition method and reileration method), vertical angle (compute the height of building or compute the unknown elevation of points.[15 hrs] Aera (computation of aera, field measurement or map measurement by division in to simple figure, by offsets from straight lines regularly spaced offsets or irregularly spaced offsets. Coordinate Geometry (rectangular and polar coordinate). [10 hrs] Travers, types of traverses, traversing calculations, angle adjustment, direction adjustment, departure and latitude, linear misclosure, relative precision, compass rule. Calculation of coordinates of all points of traverse. [15 hrs] Topographic map, contour interval, horizontal equivalent, characteristics of contours, method of contouring, interpolation pf contour map, the shape and pattern of

	contours, contour gradient, draw contour lines with a suitable interval and horizontal scale. [10 hrs] GPS and EDM geomatics, introduction of GPS, using and importance of GPS. GIS hard ware and software, GIS application for civil engineering. [13 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Tutorials 2- Homework and Assignment. 3- Test and Exams. 4- In class Question and Discussion. 5- Reports, Presentation and Posters 6- In and out class oral conservations.

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

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction – Directions (Azimuth, Bearing), types of meridians
Week 2	Computing directions
Week 3	Angle measurement, accuracy of angle measurement
Week 4	Theodolite (component of an electronic theodolite and mechanical part of theodolite)
Week 5	Horizontal angle (repetition method and reileration method)
Week 6	Vertical angles.
Week 7	Aera (computation of aera, field measurement)
Week 8	Aera (computation of aera, map measurement)
Week9	Coordinate Geometry.
Week 10	Traversing.
Week 11	Adjustment of traversing.
Week 12	Topographic map
Week 13	Contouring
Week 14	GPS and EDM geomatics
Week 15	GIS application for civil engineering.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Lab 1: principles of angle measuring instrument (theodolite instrument), balancing theodolite instrument.
Week 2	Lab 2: measuring the horizontal angle by repetition method.
Week 3	Lab 3: measuring the horizontal angle by reileration method.
Week 4	Lab 4: measuring the vertical angle to compute height of building, and compute unknown elevation of point.
Week 5	Lab 5: measuring area of land (field measurement and map measurement).
Week 6	Lab 6: Traversing.
Week 7	Lab 7: Draw contour line

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Schofield W, Breach M. Engineering surveying. CRC Press; 2007 Feb 14. 2. Shepherd FA. Engineering surveying: problems and solutions. (No Title). 1983. 3. Chandra AM. Plane surveying. New Age International; 2007.	Yes
Recommended Texts	1. Schofield W. Engineering surveying: theory and examination problems for students. Elsevier; 2001.	No
Websites	https://www.survey-solutions.co.uk/site-engineering/	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Hydraulics and Hydrology**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE402**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		2	**Semester of Delivery**		4
Administering Department		-	**College**	-	
Module Leader	Salam J. Bash AlMaliki		**e-mail**	salambash2000@yahoo.com	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Mahmood Mohammed	**e-mail**	mmhsh1988@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Fluid Mechanics	**Semester**	3
Co-requisites module	Non	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. The course introduces the analysis of the flow and pressure distribution of flowing water and wastewater. 2. Demonstration of many fundamental engineering approaches and models for sizing pipes between tanks and taps, picking pumps, and assuring a good flow distribution in water or wastewater treatment works. 3. The course will cover both pressurized and open-channel flow and the hydraulics of pipes, pumps, networks, and channels. 4. Calculation of the flow of liquid through a culvert in the various conditions. 5. Calculation of the flow of liquid above the various types of spillways. 6. Introduction to the stream Flow Hydrograph and Calculate the runoff of a site
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The ability to apply basic hydraulics to the solution of water and sanitation problems. 2. Learn how to solve such problems and how to think practically about the flow of water in engineered systems. 3. Summarize what is meant by a hydraulic structure. 4. Ability to make the initial calculations for culverts and spillways. 5. The ability to use the various charts, nomograms, and tables regarding the design procedures of each of the various cases. 6. The ability to use the various relevant conversion factors/units for the various hydraulic structures. 7. The ability to recognize the design requirements for the hydraulic structures in each of the various operating conditions. 8. The ability to analyze the hydrographs and calculate the runoff.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A- Hydraulics</u> <u>Pipes and pipe systems</u> Calculate the flow of a liquid through pipes. 1. Determination of the flow-relevant characteristics/variables of the various pipes. 2. Calculate the HGL and EGL of a pipe system. 3. Calculate the energy losses through pipe systems 4. Calculate the flow distribution in the various piping systems. 5. Determine the size of a pipe using design charts. [20hrs] <u>Open channel</u> Calculate the flow of a liquid through open channel flow. 6. Differentiate between uniform flow and non-uniform (varied) flow in an open channel. 7. Calculate the slope of a channel or pipe. 8. Calculate the cross-sectional area, wetted perimeter, and hydraulic radius of a channel or pipe. 9. Calculate the normal depth in a channel, pipe, or stream including over banks. 10. Calculate the critical depth in a channel or pipe. 11. Determine the size of a channel or pipe using design charts. [20hrs]

	Culverts Determine the flow of liquid through a culvert. 1. Identify the type of flow pattern in a culvert, and determine if it has inlet or outlet control. 2. Determine the adequacy of flow through an existing culvert using both inlet and outlet control. 3. Determine an adequate culvert size for a given discharge. Revision problem classes [20hrs] Part B - Hydrology Explain the fundamentals of watershed hydrology and their application to industry. 1. Explain the hydrologic cycle. 2. Explain a watershed's role in the hydrologic cycle, including hydrologic unit codes [15hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The course is taught through a mix of three approaches: Classroom lectures to present the basic theory, problem-solving sessions where students put the theory to work in solving practical problems, and laboratory sessions where students will test the theory against their observations of real hydraulic systems.In groups of three (maximum), students will complete ONE project. These will include significant analyses and written reports. Individual effort assessment. At the end of the semester, team members will be asked to confidentially evaluate themselves and other members of the team. A student's individual grade for the projects will be raised or lowered from the group grade based on those evaluations.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	30min./2	10% (10)	5, 15	LO #1-4, and LO#13,14
	Assignments	3	10% (10)	continuous	All
	Projects / Lab.	14	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 3, 4,5, and 6
Summative assessment	Midterm Exam	1hr/2	10% (10)	8 and 13	LO # 1-7 and 9-12
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Head loss, flow computations for single conduits
Week 2	Pipelines in Series and parallel+ Calculations on simple systems.
Week 3	Introduction to network models.
Week 4	Worked examples for various piping systems.
Week 5	Introduction to Open Channel Flow: qualitative difference from pressure flow and the concept of normal flow.
Week 6	Specific Energy, subcritical, supercritical & critical flow.
Week 7	Economic section open channels+ worked problems
Week 8	Mid-term Exam
Week 9	Introduction to culverts; types, characteristics, limitations, and sections.
Week 10	Design aspects of culverts+ worked problems
Week 11	Introduction to spillways; types, characteristics, limitations, and sections.
Week 12	Design aspects of some types of spillways+ worked problems
Week 13	Introduction to the stream Flow Hydrograph.
Week 14	Calculate the runoff of a site
Week 15	**Recap of material to date**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Study the friction and minor losses in pipes
Week 2	Flows in pipe networks
Week 3	Determination of Manning's co-efficient "n" and Chezy's co-efficient "C"
Week 4	Investigate the relationship between specific energy "E" and depth of flow "y" in a laboratory flume
Week 5	Study the flow characteristics over the hump or weir in a rectangular channel
Week 6	Study the flow characteristics of hydraulic jump developed in lab flume
Week 7	Flow Measurement using Notches or Thin-Plate Weirs
Week 8	Flow characteristics under a sluice gate.
Week 9	Flow characteristics through culverts
Week 10	Flow characteristics over various types of spillways
Week 11	Draw a Flow chart of the hydrologic cycle & discuss various components of the hydrologic Cycle
Week 12	Measurement of Rainfall by non–recording rain gauge.
Week 13	Measurement of rainfall by recording rain gauge.
Week 14	To determine the mean rainfall of an area by the Thiessen mean Polygon method

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Fundamentals of fluid mechanics, Bruce R. Munson, Theodore H. Okiishi, Wade W. Huebsch, Alric P. Rothmayer—7th edition.	NO
Recommended Texts	2. Hydraulics in Civil And Environmental Engineering, 5th. Edition. Andrew Chadwick, John Morfett and Martin Borthwick	NO
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	**Mechanics of Materials II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE401**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		2	**Semester of Delivery**		4
Administering Department			**College**		
Module Leader	Wael Raad		**e-mail**	ogaidiwael@gmail.com	
Module Leader's Acad. Title		Assistant lecturer	**Module Leader's Qualification**		Msc
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Lec. Yasir Wisam	**e-mail**	yasiraliris@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mechanics of Materials I	**Semester**	3
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Discuss the effects of applying a torsional loading to a long straight member such as a shaft or tube. 2. Review of the stress analysis that has been developed in the previous chapters regarding axial load, torsion, bending, and shear. 3. Show how to transform the stress components that are associated with a particular coordinate system into components associated with a coordinate system having a different orientation. 4. Here we will also discuss various ways for measuring strain associated with a coordinate system having a different orientation. 5. Discuss various methods for determining the deflection and slope at specific points on beams and shafts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the concept of torsion and how to calculate the internal torques. 2. Show how to determine the stress distribution within the member. 3. Determine the angle of twist when the material behaves in a linear elastic manner. 4. Statically indeterminate analysis of shafts and tubes will also be discussed, along with special topics that include those members having noncircular cross sections. 5. Learn the solution of problems where several of these internal loads occur simultaneously on a member's cross section. 6. Transform the stress components into components associated with a coordinate system having a different orientation. obtain the maximum normal and maximum shear stress at a point and find the orientation of elements upon which they act. discuss a method for finding the absolute maximum shear stress at a point when the material is subjected to both plane and three-dimensional states of stress. 7. Understand various ways for measuring strain transformed in different orientation. 8. Understand various methods for determining the deflection and slope at specific points on beams and shafts.
Indicative Contents المحتويات الإرشادية	1. Torsion: torsional deformation of circular shafts, the torsion formula, angle of twist, statically indeterminate torque-loaded members, solid non-circular shafts, thin-walled tubes having closed cross sections. [12 hrs] 2. Combined loading: state of stress caused by combined loading. [4 hrs] 3. Stress transformation: plane stress transformation, general equation of plane stress transformation, Mohr's circle, principal stresses, maximum in-plane shear stress, absolute maximum shear stress. [12 hrs] 4. Strain transformation: plane strain transformation, general equation of plane strain transformation, Mohr's circle, principal strains, maximum in-plane shear strain, absolute maximum shear strain. [4 hrs]

	5. Deformation: deflection in beams and shafts, the elastic curve, slope and displacement by integration, slope and displacement by the moment area method. [16 hrs]

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	3	15% (15)	3, 6, 10	LO # 1, 2, 3, 5, 7
	Assignments	2	15% (15)	5, 9, 13	LO # 4, 6, 8
	Projects	1	10% (10)	15	LO # 8
	Report	0	0	-	-
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-4
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Understand the concept of torsion and how to calculate the internal torques
Week 2	Determine the shear stress distribution within the member subjected to external torques.
Week 3	Determine the angle of twist when the material behaves in a linear elastic manner.
Week 4	Statically indeterminate analysis of shafts and tubes will also be discussed, along with special topics that include those members having noncircular cross sections.
Week 5	Discuss statically indeterminate shafts and tubes, along with special topics that include those members having noncircular cross sections.
Week 6	Learn the solution to problems where several of these internal loads occur simultaneously on a member's cross-section.
Week 7	Mid-term Exam
Week 8	Transform the stress components into different orientations and calculate these stresses using the general equations method.
Week 9	Transform the stress components into different orientations and calculate these stresses using Mohr's circle method.
Week 10	Calculate the principal stresses, the maximum in-plane shear stress and the absolute maximum shear stress.
Week 11	Learn how to transform the strain in any orientation using both methods: general equations and Mohr's circle, with calculating the principal strains and in-plane maximum shear strain, and absolute maximum shear strain.
Week 12	Introduce the integration method to calculate the beam deflection, the use of discontinuity functions, and the method of superposition.
Week 13	Introduce the method of superposition to calculate the beam deflection.
Week 14	Present a semi graphical technique called the moment-area method to calculate the beam deflection.
Week 15	we will use these methods to solve for the support reactions on a beam or shaft that is statically indeterminate.
Week 16	A preparatory week before the Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Mechanics of Materials, 9th ed. , R.C Hibbeler	Yes
Recommended Texts	1. Strength of Materials 4th ed., Singer and Pytel	No
Websites	1. https://www.udemy.com/course/mechanics-of-materials-sgt/	

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	**Building Services and maintenance**			**Module Delivery**	
Module Type	**Elective**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UIC503**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	3		**Semester of Delivery**	5	
Administering Department	-		**College**	-	
Module Leader	Dr. Omar Riyadh Khaleel		e-mail	dr.omaralobaidi@gmail.com	
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Ph.D.	
Module Tutor	-		e-mail	-	
Peer Reviewer Name	Dr. Mohanad Hatem		e-mail	mohshadhar@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To enhance the knowledge of students in physical properties of building services systems. 2. To choose appropriate design method of different systems. 3. To analyze the building services mathematically. 4. To get a good experience in building maintenance. 5. To educate the student in dealing with design problems and selecting the proper methods of solutions. 6. To focus on sustainability aspect in design. 7. To use recent aspects of design with considering health and safety factors.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the different systems of building services and knowing the physical principles of each system. 2. Use the appropriate methods of sustainable systems design of building services. 3. Mathematical analysis of services systems. 4. Evaluate the building and select the appropriate methods for maintenance. 5. Describe the plan for installation of building services. 6. Solve engineering problems that related to the building services design. 7. Consider Health and Safety Aspects to the building services design.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part A- Introduction to Building Services</u> • Importance of Health and Safety in buildings. • Thermal performance of buildings. [6hrs] <u>Part B- HVAC (heating, ventilation and air conditioning)</u> • Ventilation and air circulations in buildings. • Ductwork systems, jets and plumes, emitters • refrigeration and heat rejection. • Transportation Strategies in buildings. [8hrs] <u>Part C- Electrical Power load Distribution</u> • Estimation of electrical power load. • Types of electrical load distributions and cable selection. • Lighting services. [6hrs] <u>Part D- Principle of Sound waves Transportation in building</u> • Acoustics and Noise Control. • Echo times, sound mitigation, acoustic absorption materials, distribution of speakers in auditorium. [8hrs] <u>Part D- Principals of Fire</u> • Fire Control system • Detection, Suppression, distribution of fire extinguisher in buildings. [8hrs] <u>Part D- Evaluation and maintenance of buildings</u> • methods of building evaluations • determination of maintenance in buildings. [9hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Teacher-based learning: teacher explain lectures pre-class (lecture notes and videos) and in-class (traditional lecture) • Student-based learning: student will be asked to prepare presentation OR poster and react the interactive among students. • research-based learning: instructor will give students published paper to be discussed in class (open discussion class). • Instructor could give realistic cases or exercises in-class and post-class and ask student to solve these cases in order to enhance the critical thinking skills and improve the ability of students to do calculations. • Invite guest lecturer to update the students with modern steel structure industry. • Site visit to enhance the knowledge of students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	15% (15)	5, 10	LO #1, 2, 3 and 6
	Assignments	2	15% (15)	2, 12	LO # 4, 7
	Report (site visit)	1	10% (10)	13	LO # 5
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1- 7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Chapter 1:** Introduction to Building Services and importance of Health and Safety in buildings.
Week 2	**Chapter 2:** thermal performance of buildings: Massive thermal transportation: thermal properties of building members, study the thermal transportation indoor and outdoor of the building (hot gain and hot losses).
Week 3	Thermal conductivity and thermal insulations of buildings. Applications on thermal mitigation Methods
Week 4	**Chapter 3:** HVAC (heating, ventilation and air conditioning): Ventilation and air circulations in buildings.
Week 5	**Ductwork systems, jets and plumes, emitters, pump and fan laws, refrigeration and heat rejection.**
Week 6	**Chapter 4:** Transportation Strategies in buildings: types of transportations such as moving walks, escalators, lifts and their relations to energy consumption.
Week7	**Mid-term Exam**
Week 8	**Chapter 5:** Electrical Power load Distribution: estimation of electrical power load, types of electrical load distributions and cable selection, Electrical motor control, alternative currents properties.
Week 9	Lighting services, lighting tensity distribution.
Week 10	**Chapter 6:** Principle of Sound waves Transportation in building, Acoustics and Noise Control, echo times, sound mitigation.
Week 11	acoustic absorption materials, distribution of speakers in auditorium.
Week 12	**Chapter 7:** Principals of Fire: Fire Control system, Detection, Suppression.
Week 13	**distribution of fire extinguisher in buildings.**
Week 14	**Chapter 8:** Evaluation and maintenance of buildings: methods of building evaluations, determination of maintenance in buildings.
Week 15	**determination of maintenance in buildings.**
Week 16	Recap and preparation for Final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	BUILDING SERVICES HANDBOOK. Fourth edition. Copyright ª 2007, Roger Greeno and Fred Hall. Published by Elsevier Limited. All rights reserved	No
Recommended Texts	Advances in Building Services Engineering. Studies, Researches and Applications. Loan Sarbu.	No
Websites	Available websites related to the subject.	

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	**Numerical Methods**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE502**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	3		**Semester of Delivery**	5	
Administering Department	-		**College**	-	
Module Leader	Mustafa Jamal Abrahim		**e-mail**	mustafajamal763@gmail.com	
Module Leader's Acad. Title	Assistant lecture		**Module Leader's Qualification**	Master degree	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Reem Siham		**e-mail**	engreemsiham86@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mathematics II	**Semester**	1&2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Introducing the student to the skills of scientific mathematical foundations and learning solutions to engineering problems using multiple numerical and engineering methods. 2. Identify design and analysis using numerical methods 3. Calculation of quantities approximate manually by numerical equations 4. Study numerical equations and their use in engineering applications 5. Using numerical methods in calculating the engineering safety coefficient 6. Calculating changes that may occur in design or engineering works, by numerical methods 7. Studying the effect of the time factor on numerical calculation methods 8. Knowing the importance of the sequence of solving numerical equations in some engineering calculations and applications 9. Studying some practical applications related to engineering phenomena or problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The student's understanding of mathematical theories and laws that enable the student to apply them in the fields of civil engineering 2. The student acquires the skill of thinking and analysis using numerical methods 3. - Enabling the student to quickly calculate or analyze quantities mathematically 4. Make the student able to accurately calculate the amount of engineering damage using numerical equations 5. - Predicting the percentage of error that may accompany engineering works and thus calculating the safety coefficient 6. Preparing the student to deal with any change that may occur in the statistical works related to the engineering aspect of the work, such as bills of quantities or spare orders. 7. Make the student able to deal with the timetables related to the implementation of the engineering paragraphs and their sequence 8. Enable student to think and analyze engineering phenomena and their applications 9. Enable student to think and analyze topics related to solving practical problems.
Indicative Contents المحتويات الإرشادية	• Modified Euler, Milnes Predictor –corrector method. [10 hrs] • Gaussian elimination Method, Gauss-Jordan elimination Method. [10 hrs] • Jacobi Method (Indirect Methods to solve Linear Equations Systems) . [10 hrs] • The Gauss-Seidel Method. [10 hrs] • Numerical method of Rung-Kutta method. [10 hrs] • Numerical solution of equation one variable location of root, Newton Raphson method. [10 hrs] • The Laplace transform and Inverse Laplace transforms, Convolution theorem. [10 hrs]

	• Numerical methods for solving integration: Trapezoidal rule, Simpsons rule. [10 hrs] • Interpolation Curve Fitting: Method of least Square. [10 hrs] • Numerical Analysis: Finite Differences. [10 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Interactive lectures for students and holding panel discussions with them and asking them for periodic reports and seminars throughout the semester and for various topics related to civil engineering calculations using numerical methods

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20% (20)	3, 8	LO #1, 4, and 7
	Assignment	2	10% (10)	2,9	LO #2, 6 and 8
	Report	1	10% (10)	13	LO #3, 5 and 9
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1- 6
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Modified Euler method
Week 2	Gaussian elimination Method
Week 3	Gauss-Jordan elimination Method
Week 4	Jacobi Method
Week 5	The Gauss-Seidel Method
Week 6	Numerical method of Rung-Kutta method
Week 7	Newton Raphson method
Week 8	Mid-term Exam
Week 9	Laplace Convolution theorem
Week 10	Trapezoidal rule, Simpsons rule
Week 11	Interpolation
Week 12	Numerical Analysis: Finite Differences
Week 13	reports and seminars
Week 14	reports and seminars
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Epperson JF. An introduction to numerical methods and analysis. John Wiley & Sons; 2013 Jun 6.	Yes
Recommended Texts	**1.** Numerical Analysis, ninth edition Richard L. Burden. Youngstown State University.	Yes
Websites	https://www.math.hkust.edu.hk/~machas/numerical-methods.pdf	

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	**Reinforced Concrete Design I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE505**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		3	**Semester of Delivery**		5
Administering Department		-	**College**	Type College Code	
Module Leader	Mohanad Hatem Shadhar		**e-mail**	mohshadhar@gmail.com	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Wael Raad Saadallah	**e-mail**	ogaidiwael@gmail.com	
Scientific Committee Approval Date		05/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mechanic of materials I&II	**Semester**	3,4
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To introduce advanced principles/ concept for design and analysis of reinforced concrete structures and their constructability. 2. To understand material properties and behavior of reinforced concrete. 3. To understand the design philosophies of reinforced concrete structures. 4. To design serviceable and strength structural members. 5. To enhance the student of the health and safety aspects associate with the design and construction of reinforced concrete structures.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Generalized the basic material properties of reinforcement and concrete and their role in the behavior of concrete structures. 2. Apply design method, codes, specification and standard that govern the structural design of reinforced concrete members. 3. Compute the design gravity loads including dead and live loads acting on reinforced concrete structures. 4. Apply the concept of limit states design in design procedure of reinforced concrete members. 5. Design singly reinforced concrete beams to tension only 6. Describe the theoretical concepts that from the basis of design beams, slabs. 7. Design beam or slab depth for the purpose of deflection control. 8. Design T-beam sections which behave as a rectangular section and one-way slabs. 9. Identify the requirement for compression reinforcement in beams (double reinforce sections). 10. Satisfy the strength and serviceability.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A: Introduction to Reinforced Concrete Structures</u> • Structural elements and structural forms, loads, design codes and specifications. • Design criteria, design Philosophy, strength versus Working-Stress, fundamental assumptions for reinforced concrete behavior. [10 hrs] <u>Part B: Design of Reinforced Concrete Beams</u> • Flexure design of a rectangular beam with tension reinforcement only. • Analysis of a rectangular beam with tension and compression reinforcements (a Doubly Reinforced Beam). • Design of a Doubly Reinforced Rectangular Section., Flexure Analysis of a Section with T Shape. Design of a Beam with T-Shape. [24 hrs] <u>Part C - Serviceability</u> • Cracking in flexural members code provisions for crack control. • Control of deflections, immediate deflection, deflections due to Long-term short-term Loads. [16 hrs] <u>Part D - Design of Reinforced Concrete Slabs</u> • Design of One-Way slabs. • Analysis of One-Way Slab System Design. [10 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The concepts, principles and theories related to reinforced concrete design are given in interactive lectures with worked examples. In terms of directed study, students are encouraged to study the lecture note and solve the tutorial sheet given and the end of each topic and submitted the tutorial sheet for formative feedback. The module is assessed through periodically quizzes, tutorial sheet, assignments and 2 exams which take place at the end of semester (Mid and final exams).

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	3	15% (15)	3,9,13	LO #1, 2, 3 ,5 and 8
	Assignments	2	15% (15)	5, 12	LO # 6 and 7
	Report	1	10% (10)	8	LO # 9 and 10
Summative assessment	**Midterm Exam**	2 hrs	10% (10)	10	LO # 1-5
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Module details presentation + Recap of Pre-requisite modules
Week 2	Structural Elements and Structural Forms, Loads, Design Codes and Specifications
Week 3	Design Criteria, Design Philosophy, Strength Versus Working-Stress Design Methods
Week 4	Fundamental Assumptions for Reinforced Concrete Behavior
Week 5	Flexure Design of a Rectangular Beam with Tension Reinforcement Only
Week 6	Analysis of a Rectangular Beam with Tension and Compression Reinforcements
Week 7	continue
Week 8	Design of a Doubly Reinforced Rectangular Section
Week 9	continue
Week 10	Control of Deflections, Immediate Deflection, Deflections Due to Long-term short-term Loads
Week 11	continue
Week 12	Design of One-Way slabs
Week 13	Design of One-Way slabs with T-beam
Week 14	Analysis of One-Way Slab System
Week 15	Analysis of One-Way Slab with T-beam
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. A. H. Nilson, D. Darwin, and C. W. Dolan, Design of Concrete Structures, 13th Edition, McGraw Hill, 2004. 2. D. Darwin, C. W. Dolan, and A. H. Nilson, Design of Concrete Structures, 15th Edition, McGraw Hill, 2015 (Metric Edition). 3. Building Code Requirements for Structural Concrete (ACI318M-14).	Yes
Recommended Texts	1. James K. Wight, James G. Macgregor. Reinforced concrete, Mechanics and Design. Sixth Edition, Pearson Prentice Hall, USA. 2. Design of Reinforced Concrete by J.C. McCormac and R.H. Brown, Eighth Edition, John Wiley & Sons.	No
Websites	https://www.worldofconcrete.com/en/attendee.html	

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	**Sanitary Engineering I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE504**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	3		**Semester of Delivery**	5	
Administering Department	-		**College**	-	
Module Leader	Dr.ahmad benwan hassan		**e-mail**	Ahmadbenwan99@gmail.com	
Module Leader's Acad. Title	lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Salam J. Bash AlMaliki		**e-mail**	salambash2000@yahoo.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Hydraulics and Hydrology	**Semester**	4
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Understand the principal concepts of Sanitary Engineering and water treatment. 2. Assess water quantities required for municipal, commercial and industrial uses and water consumption rates. 3. Discriminate water impurities and treatment methods depending on these impurities. 4. Design of water distribution systems with different network apparatus. 5. Apply water treatment steps and techniques. 6. Appraise population growth rate. 7. Estimate water consumption per capita and for firefighting. 8. Outline water pumps and types and suitability of use. 9. Classify water sources for domestic uses.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Assess water properties, quality and quantity for different demands. 2. Evaluate the population and their water consumption 3. Design the required amount of water for firefighting. 4. Classify and identify the types of pipes, connections and valves used in water distribution systems. 5. Analyze and design pipe networks. 6. Design the required power for water pumps. 7. Interpret and apply the principles of sedimentation, coagulation & flocculation, filtration, disinfection and dissolved solid removal (hardness removal). 8. Plan and prepare of water treatment plants design with its different units. 9. Demonstrate an awareness of importance of water treatment of environmental health 10. Carry out different tests on water quality tests.
Indicative Contents المحتويات الإرشادية	1. Forecasting population and fire Demand and calculating the rate of water consumption. 2. Quality of water Supplies and collection of water and studying physical, chemical, and biological characteristics of water. 3. Water distribution system types and layouts with the different pipes materials and pipe network apparatus. 4. Analysis and design of water network. 5. Finding the proper pumps type and power to supply the water network. 6. Water treatment to produce and maintain water that is hygienically safe, aesthetically attractive and palatable through water treatment plant units (intakes, screening, sedimentation, filtration, aeration, disinfection, coagulation, softening, etc.)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures. 2. Tutorials. 3. Assignments and Homework. 4. Lab. Experiments. 5. Exams and Tests. 6. In-Class Questions and Discussions. 7. Connection between Theory and Application. 8. Field Trips. 9. Extracurricular Activities. 10. In-Class learning videos and photos to discuss.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction, water consumption,
Week 2	Forecasting population, fire demand
Week 3	Water quality supplies, studying physical, chemical, and biological characteristics of water.
Week 4	Water distribution systems layouts and components
Week 5	Pipes, valves, flow in pipes analysis and design
Week 6	Water pumps
Week 7	Mid-term Exam + introduction to water treatment plant design
Week 8	Intake design, screen design
Week 9	Sedimentation theory and sedimentation tank design
Week 10	Rapid mixing tank design, jar test,
Week 11	Coagulation process
Week 12	Flocculation, flocculation tank design
Week 13	Disinfection process, type of disinfectants
Week 14	Water softening, ion exchange,
Week 15	Reverse osmosis, membrane filtration

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	introduction to lab instruments and glassware
Week 2	physical characteristics of water
Week 3	Color test
Week 4	pH testing
Week 5	Acidity testing
Week 6	Alkalinity test
Week 7	Electrical Conductivity tests

Week 8	Turbidity test
Week 9	Determination of Dissolved and suspended solids and Total solids test.
Week 10	Jar test
Week 11	Water Hardness test
Week 12	Determination of carbonate in water samples
Week 13	Determination of aluminum in water samples
Week 14	Sulphate, nitrate and phosphate tests
Week 15	Chloride tests

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Water Supply and Sewerage, 5th edition by E.W. Steel andT.J. McGhee	Yes
Recommended Texts	Water Supply Engineering by P.N. Modi	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	**Soil Mechanics I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE501**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	3		**Semester of Delivery**	5	
Administering Department	-		**College**	-	
Module Leader	Reem Siham Tawfeeq		**e-mail**	engreemsiham86@gmail.com	
Module Leader's Acad. Title	Assistant Lecture		**Module Leader's Qualification**	MSc	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Dr. Bilal Muiassar		**e-mail**	bilal.muasser@aliraqia.edu.iq	
Scientific Committee Approval Date	11/ 6 /2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Identify methods for calculating engineering soil properties and bearing capacity 2. Knowledge of the importance of engineering soil properties and their behavior on engineering facilities 3. Identify the types of foundations, their characteristics, and the extent of their resistance to loads 4. Knowing the effect of water on the behavior of soil and foundations 5. Familiarity with the impact of the surrounding environmental conditions on soil behavior 6. Know how to classify soil type engineering 7. Knowing how to test the soil in the laboratory and its validity for the work of building over it 8. Treating the soil in case it fails under the influence of the loads placed on it
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Familiarity of soil properties 2. Knowledge of the engineering behavior of soil when subjected to loads and stresses 3. Identify the most important engineering problems facing soil and ways to treat or control them 4. Avoid soil failure or collapse by knowing the methods of soil replacement, compaction, or soil injection with chemicals and regular cement. 5. Transforming the relationship between the soil and the source into mathematical relations that the engineer can use in designing the structural elements 6. Achieving economics in engineering design 7. Providing a safety factor in engineering design 8. Familiarity with effects of the surrounding conditions on soil engineering properties.
Indicative Contents المحتويات الإرشادية	Particle size analysis; Soil description and classification. [15 hrs] Phase relationships. [15 hrs] Soil compaction. [15 hrs] Field measuring of density. [15 hrs] Seepage and what is soil water. [15 hrs] Permeability. [15 hrs] Field permeability measuring. [15 hrs] Seepage theory; Flow nets; Seepage in anisotropic. [15 hrs] Nonhomogeneous soils and through embankment dams. [15 hrs] Effective stress; and Influence of seepage on effective stress. [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in presenting this unit is to provide interactive lectures and conduct laboratory experiments on soil samples brought from real work sites. As well as conducting field visits to engineering work sites and linking them with the information that the student receives in the semester.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Particle size analysis
Week 2	Soil description and classification
Week 3	Phase relationships
Week 4	Soil compaction
Week 5	Density of soil
Week 6	Mid-term Exam
Week 7	Field measuring of density
Week 8	Seepage and what is soil water
Week 9	Permeability
Week 10	Field permeability measuring
Week 11	Seepage theory
Week 12	Flow nets; Seepage in anisotropic
Week 13	Nonhomogeneous soils
Week 14	Effective stress; and Influence of seepage on effective stress
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Lab 1: Sieve Analysis
Week 2	Lab 2: Moisture Content
Week 3	Lab 3: Specific Gravity of Soil
Week 4	Lab 4: Liquid and Plastic Limit of Soil
Week 5	Lab 5: Shrinkage Limit of soil
Week 6	Lab 6: Hydrometer Analysis
Week 7	Lab 7: Field density of soil

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Principles of Geotechnical Engineering Eighth Edition, SI BRAJA M. **DAS**, KHALED SOBHAN.	Yes
Recommended Texts	1. Soil mechanics by **Lambe**, T. William; Whitman**.** 2. B. M. Das, " Principles of Foundation Engineering" Eighth Edition,	Yes
Websites	https://csmrs.gov.in/content/18_1_SoilMechanics.aspx	

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	**Structural Analysis I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE604**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		3	**Semester of Delivery**		6
Administering Department		-	**College**	-	
Module Leader	Lec.Yasir Wisam Abduljaleel		**e-mail**	yasiraliris@gmail.com	
Module Leader's Acad. Title		lecture	**Module Leader's Qualification**		MSc
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Dr.Mohanad Hatem	**e-mail**	mohshadhar@gmail.com	
Scientific Committee Approval Date		11/06/2023	**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**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. This course has been designed for undergraduate (civil) engineering students or those interested in developing a deeper understanding of introductory structural analysis concepts and methods. 2. Familiarize with the general stiffness matrix methods and their application in structural analysis. 3. Apply theoretical concepts to practical examples and real-world engineering problems in order to enhance problem-solving skills. 4. Develop a comprehensive understanding of structural analysis techniques and their role in designing safe and efficient structures. 5. Enhance critical thinking and analytical skills through the application of different structural analysis methods. 6. Describe the essential concepts and methods of structural analysis and provide examples demonstrating their applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the fundamental concepts and principles of structural analysis and design. 2. Apply mathematical and physical principles to analyze and predict the behavior of different types of structures. 3. Analyze the internal forces, stresses, and deformations within structures under various loading conditions. 4. Determine the stability and safety of structures by evaluating factors such as stability, equilibrium, and material strength. 5. Demonstrate proficiency in using structural analysis software and tools to model and analyze complex structures. 6. Evaluate the performance and behavior of structural elements such as beams, columns, trusses, and frames. 7. Interpret and apply relevant design codes, standards, and regulations to ensure safe and reliable structural designs. 8. Develop critical thinking and problem-solving skills to address real-world structural engineering challenges. 9. Communicate effectively and present technical information related to structural analysis and design through oral and written means.
Indicative Contents المحتويات الإرشادية	Indicative Content Includes the Following: Part A -Equilibrium, Stability and Determinacy of structures • Review of shear force and bending moment diagram in beams and frames. • Trusses and Frames Analysis of statically determinate. • Plane truss: method of joints and method of sections. • Deflection of truss: Method of virtual work. • Moment area method, conjugate beam method and virtual work method. • Deflection of beams and frames: Moment area method, conjugate beam method and virtual work method. • Influence line diagram and moving loads [32hrs] Part A - Analysis of statically indeterminate structures • Plane truss using method of consistent deformations. • Beams and Frames: Method of consistent deformations. • Beams and Frames: Moment distribution method. • Beams and Frames: Slope deflection method.

	• Cables And Arches. [28hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. **Lectures**: Core concepts and theories are presented to students during lectures, often supplemented with slides, diagrams, and videos for better understanding. 2. **Tutorials/Workshops**: Tutorials or workshops provide opportunities for students to apply lecture material to solve problems, analyze case studies, and interact with instructors or tutors for additional guidance and clarification. 3. **Problem-Based Learning**: Assignments or projects may be given to students, often based on real-world scenarios, to apply their knowledge and develop critical thinking and problem-solving skills. 4. **Group Projects**: Collaboration on group projects encourages teamwork and communication skills. It can also provide a platform for peer-to-peer learning. 5. **Self-Directed Learning**: Students are encouraged to review lecture materials, read recommended textbooks and resources, and practice problem solving in their own time. This enhances their understanding and retention of the course material. 6. **Online Learning Platforms**: The use of online learning management systems, such as Moodle or Blackboard, can provide additional learning resources, enable online discussions, and allow students to access lecture materials and assignments at their own pace. 7. **Guest Lectures/Seminars**: Professionals from the industry or academia may be invited to give talks on specific topics, sharing their expertise and practical experiences. 8. **Formative Assessment and Feedback**: Regular quizzes or tests can be used to assess student understanding and provide feedback. This helps students identify areas they need to focus on and helps instructors adjust teaching strategies as necessary. 9. **Field Trips**: Visits to construction sites or structural engineering firms can provide a practical perspective on how structural analysis principles are applied in the real world. These learning and teaching strategies aim to promote active engagement, apply theoretical concepts in a practical context, and develop the skills necessary for future professional practice in Civil Engineering.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week1	Equilibrium, Stability and Determinacy of structures, Review of shear force and bending moment diagram in beams and frames
Week 2	Stability And Determinacy of Beams, Trusses and Frames Analysis of statically determinate structures, Plane truss: method of joints and method of sections
Week 3	Analysis of statically determinate structures, Deflection of truss: Method of virtual work
Week 4	Analysis of statically determinate structures, Deflection of beams and frames: Moment area method, conjugate beam method and virtual work method
Week 5	Analysis of statically determinate structures, Deflection of beams and frames: Moment area method, conjugate beam method and virtual work method
Week 6	Analysis of statically determinate structures, Influence line diagram and moving loads
Week 7	Continued

Week 8	Analysis of statically indeterminate structures, Plane truss using method of consistent deformations
Week 9	Analysis of statically indeterminate structures, Beams and Frames: Method of consistent deformations
Week 10	Continued
Week 11	Analysis of statically indeterminate structures, Beams and Frames: Moment distribution method
Week 12	Analysis of statically indeterminate structures, Beams and Frames: Slope deflection method
Week 13	Continued
Week 14	Cables And Arches
Week 15	Continued
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. **Fundamentals of Structural Analysis** (Fifth Edition) by Kenneth M. Leet et al. 2018	Yes
Recommended Texts	2. **Structural analysis** (Eighth Edition) by R.C. Hibbeler 2012	Yes
Websites	1. https://www.udemy.com/course/structural-analysis-i/	

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	**Computer Applications in Civil Engineering**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**UICE605**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level		3	**Semester of Delivery**		6
Administering Department		-	**College**	Type College Code	
Module Leader	Mohanad Hatem Shadhar		**e-mail**	mohshadhar@gmail.com	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Wael Raad Saadallah	**e-mail**	ogaidiwael@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Describe the fundamental tools, knowledge, and skills required to model, evaluate, and design structures. 2. A fundamental knowledge of protections against disproportionate collapse and how structures respond to unexpected loading conditions. 3. Offer a strong basis in design and analysis using the proper software. 4. To advertise the use of computer programming and technical skills in the solving of civil engineering-related problems. 5. To provide students who are inclined toward structural engineering a solid foundation in reinforced concrete.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Specify appropriate materials, components, and systems for the design and construction of single-story and multi-story steel and composite structures. 2. Create models to analyze the responses of steel and composite structures to lateral and gravitational loading. 3. Construct a single or multiple-story steel building with distinct components and connections to codes using design criteria as a reference. 4. Examine sustainability, constructability, and health and safety concerns as they relate to the design and construction of steel and composite structures. 5. 3D spatial consciousness. 6. Graphical data presentation. 7. Interpret the linear and nonlinear response phases of the materials used to construct RC structures and use the appropriate material models for research on the immediate and long-term responses of RC members. 8. Examine and create continuous, combined, and spread footings.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A- Introduction</u> • Overview of ETABS software. • Menus and toolbars. [4hrs] <u>Part B- Modelling</u> • Grid system. • Geometrical modeling. • Materials properties. • Materials definitions. • Type of elements. • Sections. • Defining seismic loads. • Creating plate elements. [10hrs] <u>Part C- Analyses and Design of created models.</u> • Analyses model of reinforced concrete structure. • Analyses model of steel structure. • Analyses truss structure. • Design of strip footing. • Design of raft foundation. [33hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The concepts, principles and theories related to reinforced concrete design are given in interactive lectures with worked examples. In terms of directed study, students are encouraged to study the lecture note and solve the tutorial sheet given and the end of each topic and submitted the tutorial sheet for formative feedback. The module is assessed through periodically quizzes, tutorial sheet, assignments and 2 exams which take place at the end of semester (Mid and final exams).

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	26	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Module details presentation
Week 2	Introduction; An overview of ETABS software, Menus and toolbars
Week 3	Modelling: Grid system, Geometrical modeling, Materials properties.
Week 4	Type of elements, Sections, defining seismic loads, Creating plate elements.
Week 5	Continued
Week 6	Analyses and Design of created models; Analyses model of reinforced concrete structure.
Week 7	continued
Week 8	Analyses model of steel structure
Week 9	Continued
Week 10	Analyses truss structure
Week 11	Continued
Week 12	Design of strip footing
Week 13	Continued
Week 14	Design of raft foundation
Week 15	Continued
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. ETABS, C. (2016). v16 User's Guide Manual. *Computers & Structures: Berkeley, CA, USA*.	Yes
Recommended Texts	2. National Information Service for Earthquake Engineering (US), & Berkeley. Earthquake Engineering Research Center. (1991). *Computer Software for Earthquake Engineering*. NISEE/Computer Applications, Earthquake Engineering Research Center, University of California.	No
Websites	https://www.csiamerica.com/	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Reinforced Concrete Design II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE601**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		3	**Semester of Delivery**		6
Administering Department		-	**College**	Type College Code	
Module Leader	Mohanad Hatem Shadhar		**e-mail**	mohshadhar@gmail.com	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Wael Raad Saadallah	**e-mail**	ogaidiwael@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Develop conceptual design of reinforced concrete buildings. 2. Enhance student understanding of the health and safety aspects associated with the design and construction of reinforced concrete structures. 3. Provide students with the ability to use the methods of analysis and design of reinforced concrete building elements in accordance with ACI 318-14. 4. Provide an understanding of the overall stability requirements of reinforced concrete buildings in accordance with ACI 318-14. 5. Provide an understanding of the serviceability requirements of Concrete buildings to improve durability and sustainability aspects.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Apply design method, codes, specification and standard that govern the structural design of reinforced concrete members. 2. Identify the necessity of deflection and crack control in satisfying serviceability requirements of RC Structures. 3. Design RC two-way slab systems using Direct Design Method. 4. Design and detail of main structural members in concrete buildings. 5. Apply Health and Safety legislation to the design of concrete structures. 6. To design serviceable and strong beams and columns. 7. Design a simply supported beam for flexure and shear 8. Design continuous beams for flexure and shear. 9. Design beams for shear and torsion. 10. Satisfy the strength and serviceability.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A: Design of reinforced concrete beam</u> • Design and analysis of Continuous Beams [6 hrs] <u>Part B: Shear and Diagonal Tension in Beams</u> • Basic Concepts. • Computing of Applied Factored Shear Force $\boldsymbol{Vu}$. • Shear Strength Provided by Concrete $\boldsymbol{Vc}$. • Shear Strength Provided by Shear Reinforcement $\boldsymbol{Vs}$. • Shear Design Based on the More Detailed Relation for $\boldsymbol{Vc}$. • Shear Design with Effects of Axial Loads. [22 hrs] <u>Part C: Analysis and Design for Torsion</u> • Basic Concepts. • ACI Provisions for Torsion Classification and Computing of Tu. • ACI Provisions for ϕTn. • Design of beams for shear + torsion; Bar development length. [8 hrs] <u>Part D: Design of Reinforced Concrete Columns</u> • ACI Analysis Procedure for a Short Column under an Axial Load (Small Eccentricity). • Analysis of a Column with Compression Load Plus Uniaxial Moment. [16 hrs]

	Part E: Design of Edge Supported Two-Way Slabs • Design of an Edge Supported Two-way Solid Slab Including Analysis and Design of Supporting Continuous Beams. [8 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The concepts, principles and theories related to reinforced concrete design are given in interactive lectures with worked examples. In terms of directed study, students are encouraged to study the lecture note and solve the tutorial sheet given and the end of each topic and submitted the tutorial sheet for formative feedback. The module is assessed through periodically quizzes, tutorial sheet, assignments and 2 exams which take place at the end of semester (Mid and final exams).

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	15% (15)	3,9,13	LO #1, 2, 3 ,5 and 9
	Assignments	2	15% (15)	5, 12	LO # 6 and 7
	Report	1	10% (10)	8	LO # 9 and 10
Summative assessment	**Midterm Exam**	2 hrs	10% (10)	10	LO # 1-7
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Module details presentation + Recap of Pre-requisite modules
Week 2	Design of reinforced concrete beam; Design and analysis of Continuous Beams
Week 3	Continue
Week 4	Shear and Diagonal Tension in Beams; Basic Concepts, Shear Strength Provided by Concrete $\boldsymbol{Vc}$, Shear Strength Provided by Shear Reinforcement $\boldsymbol{Vs}$, Computing of Applied Factored Shear Force $\boldsymbol{Vu}$
Week 5	Continue
Week 6	Shear Design Based on the More Detailed Relation for $\boldsymbol{Vc}$, Shear Design with Effects of Axial Loads
Week 7	Analysis and Design reinforced concrete beams for Torsion, ACI Provisions for Torsion Computing of Tu, Provisions for ϕTn, Design of beams for shear + torsion; Bar development length
Week 8	Continue
Week 9	Design of Reinforced Concrete Columns; ACI Analysis Procedure for a Short Column under an Axial Load (Small Eccentricity).
Week 10	Continue
Week 11	Analysis of a Column with Compression Load Plus Uniaxial Moment
Week 12	Design of Edge Supported Two-Way Slabs
Week 13	Continue
Week 14	Design of an Edge Supported Two-way Solid Slab Including Analysis and Design of Supporting Continuous Beams
Week 15	**continue**
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. A. H. Nilson, D. Darwin, and C. W. Dolan, Design of Concrete Structures, 13th Edition, McGraw Hill, 2004. 2. D. Darwin, C. W. Dolan, and A. H. Nilson, Design of Concrete Structures, 15th Edition, McGraw Hill, 2015 (Metric Edition). 3. Building Code Requirements for Structural Concrete (ACI318M-14).	Yes
Recommended Texts	4. James K. Wight, James G. Macgregor. Reinforced concrete, Mechanics and Design. Sixth Edition, Pearson Prentice Hall, USA. 5. Design of Reinforced Concrete by J.C. McCormac and R.H. Brown, Eighth Edition, John Wiley & Sons.	No
Websites	https://www.worldofconcrete.com/en/attendee.html	

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	**Sanitary Engineering and Plumbing Design II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE600**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	3		**Semester of Delivery**	6	
Administering Department			**College**	-	
Module Leader	Dr.ahmad benwan hassan		**e-mail**	Ahmadbenwan99@gmail.com	
Module Leader's Acad. Title	lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Mahmood Mohammed Hamzah		**e-mail**	mmhsh1988@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Sanitary Engineering I	**Semester**	5
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Identify concepts of wastewater and Plumbing Engineering. 2. Demonstrate an awareness of importance of waste water treatment to environmental health nationally and internationally. 3. Provide an insight into sewage pollution control design and strategies
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	4. Calculate de-oxygenation rates, the bio-chemical oxygen demand (BOD) and dissolved oxygen in natural streams. 5. Evaluate the dry weather flow and the storm water quantity 6. Analyze and design of wastewater pipe networks, pumps and firefighting pipe networks. 7. Design the wastewater treatment plant with its different units. 8. Explain sludge treatment and develop disposal techniques. 9. Carry out different tests on water quality tests.
Indicative Contents المحتويات الإرشادية	1. Introduction to wastewater and its characteristics 10. Wastewater quantities for dry weather flow and storm water quantities. 11. Sewer system components and design. 12. Sewers are designed to carry the maximum quantity of sanitary sewage likely to be produced from the contributing area to the particular sewer. 13. Self-purification of Natural Streams: As human and industrial activity has increased, so has the amount of pollutants discharged into the water bodies. Various types of industrial chemicals, fertilizers, and pesticides end up in water. 14. Wastewater Treatment: Characteristics of a municipal wastewater, the degree of treatment required. 15. Sludge Treatment and Disposal. 16. Pluming engineering: Design the water supply and waste water collection in buildings. 17. Water based firefighting systems

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures. 2. Tutorials. 3. Homework and Assignments. 4. Lab. Experiments. 5. Tests and Exams. 6. In-Class Questions and Discussions. 7. Connection between Theory and Application. 8. Field Trips. 9. Extracurricular Activities. 10. In- and Out-Class oral conservations.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to wastewater and its characteristics
Week 2	Biochemical oxygen demand
Week 3	Dry weather flow, storm water quantity
Week 4	Sewer system components
Week 5	Hydraulic design of sewers
Week 6	Self-purification of Natural Streams
Week 7	Mid-term Exam
Week 8	Design of wastewater treatment plant units
Week 9	Sludge Treatment and Disposal

Week 10	Introduction for pluming engineering
Week 11	Cold water system in buildings
Week 12	Hot water system in buildings
Week 13	Wastewater collection in buildings
Week 14	Introduction to water-based fire protection systems
Week 15	Design of water-based fire protection systems in buildings
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Dissolved oxygen test
Week 2	Biochemical Oxygen Demand (BOD) test
Week 3	Chemical Oxygen Demand COD test
Week 4	Residual chlorine test
Week 5	Nitrate into water test
Week 6	Phosphate tin water est

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Water Supply and Sewerage, 5th edition by E.W. Steel andT.J. McGhee	Yes
Recommended Texts	Wastewater Engineering Treatment and Resource Recovery, Metcalf & Eddy	No
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	**Soil Mechanics II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE602**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		3	**Semester of Delivery**		6
Administering Department		-	**College**	-	
Module Leader	Reem Siham Tawfeeq		**e-mail**	engreemsiham86@gmail.com	
Module Leader's Acad. Title		Asst. Lect.	**Module Leader's Qualification**		MSc
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Dr. Bilal Muiassar	**e-mail**	bilal.muasser@aliraqia.edu.iq	
Scientific Committee Approval Date		11/06/2023	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Soil Mechanics I	**Semester**	5
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Identify the shear forces and stresses that the soil is exposed to as a result of the loads placed on it 2. Distinguish the types of soil through knowledge of the characteristics of compressive and bulging soils 3. Calculating the displacement of the soil under the foundations due to the stresses that the soil is exposed to under the influence of direct loads or as a result of water leakage through the soil 4. Know the effect of water on the behavior of soil and foundations 5. Identify the properties of flexible and plastic soil 6. Know the adhesion properties of soil 7. Knowing how to test soil adhesion in the lab and its suitability for engineering construction work 8. Study and calculate the safety coefficient of the soil under the influence of various stresses
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Avoiding soil failure or collapse by knowing the behavior of the soil under the influence of the stresses resulting from the loads placed on it. 2. Knowing the effect of water leakage through the soil layers, on the foundations, by studying the expansive properties of the soil 3. Controlling the settlement of the foundations by calculating the settlement of the soil under different loads or as a result of water leakage through the soil layers 4. Controlling water leakage through the soil and the resulting problems by calculating the soil safety coefficient 5. Prevent soil failure or collapse resulting from the plasticity and elasticity properties of the soil by studying the behavior and characteristics of the elastic and plastic soils. 6. Controlling soil adhesion problems by calculating soil adhesion by mathematical equations 7. Achieving the economics of engineering design 8. Familiarity with the effects of environmental surroundings on the engineering properties of soil.
Indicative Contents المحتويات الإرشادية	• Shear strength. [15 hrs] • Mohr Coulomb criterion. [15 hrs] • Mohr's circle of stress. [15 hrs] • Shear strength of sands and clays. [15 hrs] • Pore pressure coefficients. [15 hrs] • Stresses, displacements for elastic Theory. [15 hrs] • Consolidation settlement. [15 hrs] • One-dimensional consolidation. [15 hrs] • Determination of coefficient of consolidation. [15 hrs]

	• Vertical sand drains. [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in presenting this unit is to provide interactive lectures and conduct laboratory experiments on soil samples brought from real work sites. As well as conducting field visits to engineering work sites and linking them with the information that the student receives in the semester.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	15% (10)	4, 8	LO #1, 2, 3 and 6
	Projects / Lab.	2	15% (10)	Continuous	All
	Report	1	10% (10)	12	LO # 3, 6 and 8
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	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	Shear strength
Week 2	Mohr Coulomb criterion
Week 3	Mohr's circle of stress
Week 4	Shear strength of sands and clays
Week 5	Pore pressure coefficients
Week 6	Stresses
Week 7	Displacements for elastic Theory
Week 8	Mid-term Exam
Week 9	Consolidation
Week 10	Consolidation settlement
Week 11	One-dimensional consolidation
Week 12	Determination of coefficient of consolidation
Week 13	Coefficient of consolidation; Num. solution vertical sand drains
Week 14	Num. solution
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Direct shear test
Week 2	Lab 2: Unconfined compression test
Week 3	Lab 3: consolidation drained test
Week 4	Lab 4: UnConsolidation undrained test
Week 5	Lab 5: Standard proctor test
Week 6	Lab 6: Van shear test
Week 7	Lab 7: Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Principles of Geotechnical Engineering Eighth Edition, SI BRAJA M. **DAS**, KHALED SOBHAN.	Yes
Recommended Texts	2. Soil mechanics by **Lambe**, T.William; Whitman. 3. Kaniraj S. R, "Design Aids in Soil Mechanics and Foundation Engineering", Tata McGraw Hill. 4. B. M. Das, " Principles of Foundation Engineering" Eighth Edition	Yes
Websites	https://csmrs.gov.in/content/18_1_SoilMechanics.aspx	

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	**Structures Analysis II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE604**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	3		**Semester of Delivery**	6	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Lec.Yasir Wisam Abduljaleel		**e-mail**	yasiraliris@gmail.com	
Module Leader's Acad. Title	lecture		**Module Leader's Qualification**	Master	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Dr.Mohanad Hatem		**e-mail**	mohshadhar@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Structural analysis I	**Semester**	5
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course aimed to apply advanced methods of structural analysis and explore the fundamental theory and concepts used for the analysis of complex structural systems. Also, to apply a comprehensive knowledge of the theoretical framework underpinning linear-elastic analysis of various types of structures (e.g., statically indeterminate trusses, beams and frames) encountered in civil engineering design work. Furthermore, the principles of plasticity and non-linear analysis. The skills and knowledge gained in this course are essential for the design of structures.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Apply principles of structural analysis for linear-elastic and non-linear analysis. 2. Analyses complex structures using appropriate techniques. 3. Apply qualitative analysis skills to estimate the behavior of structures. 4. Analyses complex structures using structural analysis software. 5. Critically analyses and correctly interpret results obtained from structural analysis software. 6. Critically review and present results with respect to design, sustainability and community expectations.

Indicative Contents المحتويات الإرشادية	Indicative Content Includes the Following. <u>Part A- Work-Energy Methods for Computing Deflections</u> • Introduction. • Strain Energy. • Deflections By the Work-Energy Method (Real Work). • Virtual Work: Trusses. • Virtual Work: Beams and Frames.[15hrs] <u>Part B- Analysis of Indeterminate Structures by The Flexibility Method</u> • Introduction. • Concept Of a Redundant. • Fundamentals of the Flexibility. • Analysis Using Internal Releases. • Support Settlements, Temperature change, And Fabrication Errors. [20hrs] <u>Part C- Introduction to the General Stiffness Method</u> • Introduction. • Comparison Between Flexibility and Stiffness Methods. • Analysis of an Indeterminate Structure By General Stiffness Method. [15hrs] <u>Part D-Nonlinear analysis</u> • Requirements for linear-elastic analysis. • Principle of superposition. • Qualitative analysis. • Displacement (stiffness) method. • Introduction to plasticity theory and non-linear analysis. [20hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. **Lectures**: Core concepts and theories are presented to students during lectures, often supplemented with slides, diagrams, and videos for better understanding. 2. **Tutorials/Workshops**: Tutorials or workshops provide opportunities for students to apply lecture material to solve problems, analyze case studies, and interact with instructors or tutors for additional guidance and clarification. 3. **Problem-Based Learning**: Assignments or projects may be given to students, often based on real-world scenarios, to apply their knowledge and develop critical thinking and problem-solving skills. 4. **Group Projects**: Collaboration on group projects encourages teamwork and communication skills. It can also provide a platform for peer-to-peer learning. 5. **Self-Directed Learning**: Students are encouraged to review lecture materials, read recommended textbooks and resources, and practice problem solving in their own time. This enhances their understanding and retention of the course material. 6. **Online Learning Platforms**: The use of online learning management systems, such as Moodle or Blackboard, can provide additional learning resources, enable online discussions, and allow students to access lecture materials and assignments at their own pace. 7. **Guest Lectures/Seminars**: Professionals from the industry or academia may be invited to give talks on specific topics, sharing their expertise and practical experiences. 8. **Formative Assessment and Feedback**: Regular quizzes or tests can be used to assess student understanding and provide feedback. This helps students identify areas they need to focus on and helps instructors adjust teaching strategies as necessary. 9. **Field Trips**: Visits to construction sites or structural engineering firms can provide a practical perspective on how structural analysis principles are applied in the real world. These learning and teaching strategies aim to promote active engagement, apply theoretical concepts in a practical context, and develop the skills necessary for future professional practice in Civil Engineering.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Work-Energy Methods for Computing Deflections; Introduction, Strain Energy, Deflections By the Work-Energy Method (Real Work)
Week 2	Virtual Work: Trusses
Week 3	Virtual Work: Beams and Frames
Week 4	Analysis of Indeterminate Structures by The Flexibility Method; Introduction, concept Of a Redundant, Fundamentals of the Flexibility
Week 5	Analysis Using Internal Releases
Week 6	Support Settlements, Temperature change, And Fabrication Errors
Week 7	Continued
Week 8	Introduction to the General Stiffness Method; Introduction, Comparison Between Flexibility and Stiffness Methods
Week 9	Continued
Week 10	Analysis of an Indeterminate Structure by General Stiffness Method
Week 11	Part D-Nonlinear analysis; Introduction to plasticity theory and non-linear analysis
Week 12	Requirements for linear-elastic analysis, principle of superposition
Week 13	Continued
Week 14	Qualitative analysis
Week 15	Displacement (stiffness) method
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. **Fundamentals of Structural Analysis** (Fifth Edition) by Kenneth M. Leet et al. 2018	No
Recommended Texts	2. **structural analysis** (Eighth Edition) by R.C. Hibbeler 2012	No
Websites	https://www.udemy.com/course/structural-analysis-i/	

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	**Traffic Engineering**			**Module Delivery**	
Module Type	Core			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE603**				
ECTS Credits	5				
SWL (hr/sem)	**125**				
Module Level	3		**Semester of Delivery**	6	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr. Mohammed Hadi Nahi		e-mail	mohammed.h.nahi@aliraqia.edu.iq	
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Ph.D.	
Module Tutor	-		e-mail	-	
Peer Reviewer Name	L. Ishraq Hameed Naser		e-mail	Ishraq.hameed@aliraqia.edu.iq	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To enable students to formulate the fundamental principles of traffic engineering element , traffic characteristic measurements and their interpretation for infrastructure changes or development. 2. To enable students to understand the design of traffic signal timing with a number of worked examples along with urban traffic control. 3. To evaluate the road safety and driver behaviour and its importance in accident prevention.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the design of traffic signal timing programs for junctions. 2. Perform the traffic studies necessary before making changes to or designing new road infrastructure 3. Exposing them to interdisciplinary approaches in solving engineering problems 4. Assess and conceptualize driver behavior when developing engineering solutions to improve road safety 5. Understand the Fundamental principles of traffic flow:
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: **1.** **Traffic engineering element:** Traffic Volume studies; Travel time studies; Parking studies Vehicles characteristic.[12hrs] **2.** **Traffic flow :** Methods for measuring traffic flow, spot speed studies categories of traffic flow, analysis of speed, flow and density relation [12hrs] **3.** **Traffic intersection and Signal Timing Calculations:** Saturation flow, optimum cycle time, effective green period and dealing with right turning traffic. [12hrs] **4.** **Driver Behavior and Safety:** Psychology of drivers, how drivers react in different situations, how to use knowledge of driver behavior in designing engineering solutions. [12hrs] **5.** **Fundamental principles of traffic flow**: headway, spacing, occupancy, clearance and gab . [12hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Teacher-based learning: teacher explain lectures pre-class (lecture notes and videos) and in-class (traditional lecture) • Student-based learning: student will be asked to prepare presentation OR poster and react the interactive among students. • Instructor could give realistic cases or exercises in-class and post-class and ask student to solve these cases in order to enhance the critical thinking skills and improve the ability of students to do calculations. • Invite guest lecturer to update the students with modern traffic control strategies.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	15% (15)	5, 10	LO #1, 2 and 3
	Assignments	2	10% (10)	2, 12	LO # 4
	Report (site visit)	1	5% (5)	13	LO # 5
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1, 2, 3, 5 and 6
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Traffic Volume studies
Week 2	Travel time studies
Week 3	**Continued**
Week 4	Parking studies
Week 5	**Continued**
Week 6	Vehicles characteristic
Week 7	Spot speed
Week 8	**Continued**
Week 9	categories of traffic flow
Week 10	analysis of speed, flow and density relation
Week 11	Traffic intersection
Week 12	Traffic Signal Timing Calculations: Saturation flow, optimum cycle time, effective green period and dealing with right turning traffic.
Week 13	**Continued**
Week 14	Driver Behavior and Safety
Week 15	Fundamental principles of traffic flow: headway, spacing, occupancy, clearance and gab

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Nicholas J. Garber - Traffic and Highway Engineering: 3rd (third) Edition 2. Highway Engineering, M. Rogers, Blackwell Publishing. 3. Highway Engineering, CA O'Flaherty, Edward Arnold. 4. Highway Traffic Analysis and Design, RJ Salter and NB Hounsell, Macmillan	No
Recommended Texts	1. Principles of Highway Engineering and Traffic Analysis, FL Mannering and WP Kilareski, Wiley	No
Websites	http://www.dot.state.mn.us/trafficeng/	

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	**Foundation Engineering I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE702**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	**4**		**Semester of Delivery**	**7**	
Administering Department	-		**College**	-	
Module Leader	Bilal Muiassar M.Salih		**e-mail**	bilal.muasser@aliraqia.edu.iq	
Module Leader's Acad. Title	Lecture		**Module Leader's Qualification**	**PhD**	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Asst. Lect. Reem Siham		**e-mail**	engreemsiham86@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Soil Mechanics II	**Semester**	6
Co-requisites module	Non	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Ability to learn how to utilize their knowledge in soil mechanics to perform various types of engineering calculations. This includes consolidation analysis for foundations, and stability analysis of slopes and retaining walls. 2. Ability to design and analysis of shallow foundations: Idealize a soil profile for analysis and design using Bearing Capacity Equations correctly 3. Explain earth pressure theories. 4. Estimating the ultimate bearing capacity of shallow footing. 5. Checking the stability of finite and infinite slopes with and without seepage through the infinite slope. 6. Estimation of allowable settlement of buildings, and calculation of settlement under rigid and flexible loaded areas (footings). 7. Make a complete design for the chosen type of shallow footing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To learn about types of different exploration, and select appropriate drilling, sampling and field property measurement tools for different soil profiles 2. To learn about types and purposes of different foundation systems and structures. 3. To provide students with exposure to the systematic methods for designing foundations. 4. To discuss and evaluate the feasibility of foundation solutions to different types of soil conditions considering the time effect on soil behavior. 5. To build the necessary theoretical background for design and construction of foundation systems. 6. Explain and derive the bearing capacity equations of shallow foundations. 7. Enable the student to calculate the bearing capacity of shallow footings. 8. Enable the student to estimate the total settlement of buildings (Immediate and consolidation settlement) 9. Enable the student to analyze and make geotechnical and structural design of shallow footings.

Indicative Contents المحتويات الإرشادية	• Soil investigation. [4 hrs] • Location, spacing and depth of borings, Soil exploration methods. [8 hrs] • Various methods of excavations, braced cuts and dewatering. [16 hrs] a- Reveal the hypothesis of Drilling locations, numbers and depths b- Explain the methods of drilling. c- Interpret Soil investigation report. d- Explain deep excavations e- Explain braced cuts f- Explain dewatering methods • Explain foundation types [4 hrs] • Determine type of foundation [8 hrs] • Bearing Capacity of Shallow Footings [16 hrs] • Analysis and Design shallow foundation. [22 hrs] a. Single footing & Combined footing b. Mat foundations • Explain earth pressure theories. [8 hrs] • Determine the types of lateral earth pressure. [8 hrs] • Slope Stability Analysis[14 hrs] • Settlement of Buildings [8 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1) Tutorials. 2) Homework and Assignments. 3) Tests and Exams. 4) In-Class Questions and Discussions. 5) Connection between Theory and Application. 6) Extracurricular Activities. 7) In- and Out-Class oral conservations. 8) Reports, Presentations, and Posters.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	3, 12	LO #1, 2,6 and 7
	Assignments	2	10% (10)	4,7	LO #3 and 4
	Report	1	10% (10)	12	LO # 7,9
Summative assessment	Midterm Exam	2 hr	10% (10)	8,14	LO # 1-9
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Site exploration, laboratory and insitu testing, synthesis of laboratory and field data
Week 2	Various methods of excavations, braced cuts and dewatering
Week 3	Introduction foundation engineering, performance requirements, strength and serviceability requirements
Week 4	Lateral Earth Pressure Computations
Week 5	Continue ….
Week 6	Types of shallow foundations, bearing capacity, selection of soil strength parameters,
Week 7	Bearing Capacity of Shallow Footings
Week 8	Mid Exam1
Week 9	Slope Stability Analysis
Week 10	Settlement of Buildings
Week 11	Analysis and design of shallow foundations (structural design)
Week 12	Single footing & Combined footing
Week 13	Mat foundations
Week 14	Mid Exam2
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Codute, D.P., "Foundation Design, Principles and Practices", Prentice Hall	Yes
Recommended Texts	1. Foundations and Earth Retaining Structures, M. Budhu, Wiley 2. Kaniraj S. R, "Design Aids in Soil Mechanics and Foundation Engineering", Tata McGraw Hill. 3. Swami Saran, Gopal Ranjan, "Analysis & Design of Foundations & Retaining Structures", Sarita Prakashan. 4. Nainan P Kurian, "Design of Foundation Systems", Narose Pub. House. 5. J. E. Bowles, "Foundation Analysis and Design", McGraw Hill. 6. P. C. Varghese, "Foundation Engineering", Prentice Hall of India Pvt. Ltd. 7. B. M. Das, "Principles of Foundation Engineering" Eighth Edition,	Yes
Websites	1. https://civilwale.com/types-of-foundation/ 2. https://www.civilengineeringforum.me/types-of-foundation/	

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	**Remote Sensing and GIS**			**Module Delivery**	
Module Type	**Elective**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☒ **Practical**	
Module Code	**UICE804**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	4		**Semester of Delivery**	8	
Administering Department	-		**College**	-	
Module Leader	Sarah Dhurgham Al-Jarjees		**e-mail**	sarah.aljarjees@aliraqia.edu.iq	
Module Leader's Acad. Title	Lecturer Assistant		**Module Leader's Qualification**	MSc.	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	L. Ishraq Hameed		e-mail	Ishraq.hameed@aliraqia.edu.iq	
Scientific Committee Approval Date	11/05/2023		**Version Number**	1	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims ادة الدراسية**4**أهداف ال	1. The course aims to provide a solid foundation in the fundamental principles of remote sensing, including the electromagnetic spectrum and sensors. 2. To enable learners to perform data acquisition and image interpretation. 3. To equip students with the necessary skills to analyze and interpret remote sensing data. 4. To provide hands-on experience with GIS software and tools. 5. To cover specific GIS applications, such as urban planning, environmental management, and natural resource assessment. 6. To demonstrate the integration of remote sensing and GIS technologies for enhanced spatial planning and decision-making. 7. To foster critical thinking and problem-solving skills in the context of remote sensing and GIS. 8. To introduce students to various applications of remote sensing and GIS in different disciplines. 9. To provide students with the principles of how to manage and use GIS and Remote Sensing to work with real world issues.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Students will be introduced to remote sensing and the applications and platforms used for imaging. 2. Students will learn how to collect, analyze, and interpret remote sensing data. 3. Students will excel image processing techniques, and image classification methods. 4. Students will learn how to extract meaningful information from remote sensing data to solve real-world problems. 5. Students will learn how to create, manage, analyze, and visualize spatial data using GIS. 6. Will gain skills in geospatial data manipulation, map design, and geodatabase management using GIS. 7. will be able to use Geoprocessing tools in ArcGIS. 8. will learn how to integrate remote sensing data into GIS environments, perform spatial analysis using remote sensing data, and create derived products. 9. Students will be encouraged to analyze complex spatial problems in real world problems, apply appropriate techniques, and evaluate the results. 10. They will be able to use GIS in civil engineering applications, such as projects planning and infrastructures constructions. 11. They will learn to think critically about data quality, limitations, and ethical considerations related to remote sensing and GIS.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Remote sensing principles</u> - Introduction to remote sensing, platforms used for imaging, distortion in recorded images, correcting geometric distortions, resampling, image registration example, interpret and usage of images, enhancing image contrast, fundamental of Radar imaging, geometric distortions in radar imagery. [11hrs]

	Part B – GIS software and tools - Introduction to GIS, map documents and layers, files in ArcMap, map scaling, vector data model, Raster data model, spatial resolution for raster data model, raster vs vector model, Geoprocessing tools in ArcGIS, ArcGIS extensions. [11hrs] Part C – Remote Sensing and GIS applications - Quantitative analysis, correlation and covariance, the principle components transform, the maximum likelihood classifier, the minimum distance classifier, classification and clustering. - Location allocation using GIS. - Specific GIS applications / urban planning, projects planning, GIS in constructing infrastructures. [12hrs] Part D – Capstone project / mini-project - Students will work together in groups to analyze spatial data, develop GIS solutions, and present their findings for real world issues in the context of civil engineering. [11hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The strategy for teaching this course focuses on balancing theoretical knowledge with practical application where students can apply GIS tools and techniques to real-world scenarios. This can include tasks such as data collection, data manipulation, spatial analysis, and map creation. Case studying is also included in the teaching strategy for this course to demonstrate the application of GIS in various fields which can be an effective way to engage students and to enhance their understanding of GIS in different contexts.Group projects strategy is also being adopted in this course, since assigning group projects can foster collaboration and problem-solving skills for students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO # 1, 2, 3, 4, 5, 6, 7, and 8
	Assignments	2	10% (10)	2, 12	LO # 1, 2, 3, 4, 5, 6, 7, 8, and 9
	Seminar	1	10% (10)	15	LO # 11
	Report	1	10% (10)	14	LO # 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-6
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to remote sensing, recorded images, applications and platforms used for imaging.
Week 2	Distortion in recorded images, correcting geometric distortions, interpret and usage of images, enhancing image contrast.
Week 3	Fundamental of Radar imaging, geometric distortions in radar imagery.
Week 4	Introduction to GIS, a quick tour of the software, a quick tour of ArcGIS online, geospatial data, map layers, files in ArcMap.
Week 5	Map scaling, creating vector data by digitizing in ArcMap, Raster data model, spatial resolution for raster data model, raster vs vector model.
Week 6	Geoprocessing tools in ArcGIS (a)
Week 7	Mid-term Exam
Week 8	Geoprocessing tools in ArcGIS (b)
Week 9	Location allocation using GIS.
Week 10	Quantitative analysis using GIS.
Week 11	classification and clustering using GIS.
Week 12	ArcGIS extensions.
Week 13	Applications of GIS In Civil Engineering / GIS in planning projects.
Week 14	Applications of GIS In Civil Engineering / GIS in constructing infrastructures.
Week 15	Seminar, Presentation for students mini-projects.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Remote sensing applications and platforms
Week 2	correcting geometric distortions processes, enhancing image contrast.
Week 3	Processing geometric distortions in radar imagery.
Week 4	ArcMap and ArcGIS online software introduction.
Week 5	Performing map scaling, vector data digitizing in ArcMap, Raster data model digitizing
Week 6	ArcGIS Geoprocessing tools (a)
Week 7	Mid-term Exam
Week 8	ArcGIS Geoprocessing tools (b)
Week 9	Perform location allocation using GIS.
Week 10	Perform quantitative analysis using GIS.
Week 11	Perform classification and clustering using GIS.
Week 12	ArcGIS extensions.
Week 13	Analyzing a model map using GIS / planning projects.
Week 14	Analyzing a model map using GIS / constructing infrastructures.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Liu, J.G. and Mason, P.J., 2016. *Image processing and GIS for remote sensing: techniques and applications*. John Wiley & Sons. 2. Mesev, V., 2008. *Integration of GIS and remote sensing*. John Wiley & Sons.	No
Recommended Texts	1. Gorr, Wilpen L. and Kristen S. Kurland. GIS Tutorial 1 for ArcGIS Pro: A Platform Workbook. Redlands, CA: ESRI Press. 2017. ISBN 9781589483828.	No
Websites	1. https://www.coursera.org/specializations/gis-mapping-spatial-analysis	

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
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	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	**Reinforced Concrete Design III**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE701**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		4	**Semester of Delivery**		7
Administering Department		-	**College**	Type College Code	
Module Leader	Mohanad Hatem Shadhar		**e-mail**	mohshadhar@gmail.com	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Wael Raad Saadallah	**e-mail**	ogaidiwael@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Reinforced Concrete Design II	**Semester**	6
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. The module aims at developing ability to conduct structural design of reinforced concrete elements. 2. Enhance student understanding of the health and safety aspects associated with the design and construction of reinforced concrete structures. 3. Provide students with the ability to use the methods of analysis and design of reinforced concrete building elements in accordance with ACI 318-14. 4. Provide an understanding of the overall stability requirements of reinforced concrete buildings in accordance with ACI 318-14. 5. Provide an understanding of the serviceability requirements of Concrete buildings to improve durability and sustainability aspects.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Apply design method, codes, specification and standard that govern the structural design of reinforced concrete members. 2. Design and detail of main structural members in concrete buildings 3. Apply Health and Safety legislation to the design of concrete structures. 4. Satisfy the strength and serviceability. 5. Design RC Columns with due consideration of slenderness and biaxial effects 6. Design RC flat plate slab systems. 7. Design RC Columns with due consideration of slenderness and biaxial effects 8. Demonstrate the framing structure to ensure that complete load path exist for all loads and forces and their combination. 9. Satisfy two-way slabs to shear.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A: Slender Concrete Columns</u> • Introduction and Basic Concepts. • ACI Strategies for Slender. • ACI Criteria for Neglecting of Slenderness Effects. • ACI Moment Magnifier Method for Non-sway Frames. • ACI Moment Magnifier Method for sway Frames • Analysis & design of braced columns. • Slender columns under biaxial bending. [28 hrs] <u>Part E: Design of Slabs</u> • Design of flat slab systems. • Design of flat plate slab systems. • Design of grid slabs. • Shear in two-way slabs. • Design of shear head reinforcement. • Yield line theory of slab analysis–design. [32 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The concepts, principles and theories related to reinforced concrete design are given in interactive lectures with worked examples. In terms of directed study, students are encouraged to study the lecture note and solve the tutorial sheet given and the end of each topic and submitted the tutorial sheet for formative feedback. The module is assessed through periodically quizzes, tutorial sheet, assignments and 2 exams which take place at the end of semester (Mid and final exams).

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	3	15% (15)	3,9,13	LO #1-5 and 7
	Assignments	2	15% (15)	5, 12	LO # 6 and 7
	Report	1	10% (10)	8	LO # 5 and 9
Summative assessment	**Midterm Exam**	2 hrs	10% (10)	10	LO # 1-5
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Module details presentation + Recap of Pre-requisite modules
Week 2	Slender Concrete Columns; Introduction and Basic Concepts
Week 3	ACI Strategies for Slender, ACI Criteria for Neglecting of Slenderness Effects
Week 4	Chapter 2: ACI Moment Magnifier Method for Non-sway Frames
Week 5	ACI Moment Magnifier Method for sway Frames
Week 6	Analysis & design of braced columns
Week 7	Slender columns under biaxial bending.
Week 8	Design of flat slab systems
Week 9	Design of flat plate slab systems
Week 10	Design of grid slabs
Week 11	Shear in two-way slabs
Week 12	Design of shear head reinforcement
Week 13	Continue
Week 14	Yield line theory of slab analysis–design
Week 15	**continue**
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. A. H. Nilson, D. Darwin, and C. W. Dolan, Design of Concrete Structures, 13th Edition, McGraw Hill, 2004. 2. D. Darwin, C. W. Dolan, and A. H. Nilson, Design of Concrete Structures, 15th Edition, McGraw Hill, 2015 (Metric Edition). 3. Building Code Requirements for Structural Concrete (ACI318M-14).	Yes
Recommended Texts	4. James K. Wight, James G. Macgregor. Reinforced concrete, Mechanics and Design. Sixth Edition, Pearson Prentice Hall, USA. 5. Design of Reinforced Concrete by J.C. McCormac and R.H. Brown, Eighth Edition, John Wiley & Sons.	No
Websites	https://www.worldofconcrete.com/en/attendee.html	

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	**Project in Civil Eng. I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**UICE704**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	4		**Semester of Delivery**	7	
Administering Department	-		**College**	-	
Module Leader	Dr. Omar Riyadh Khaleel		e-mail	dr.omaralobaidi@gmail.com	
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Ph.D.	
Module Tutor	-		e-mail	-	
Peer Reviewer Name	Dr. Mohanad Hatim		e-mail	mohshadhar@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This module aims: 1. Create a good platform for project student to prove their capability to link between learning of theoretical notion and practical expertise. 2. Collect and critique of the literature studies to establish a good knowledge for the research project. 3. To provide a good chance for students to show their possibility to plan and analyze the project. 4. To make the student to learn how to select project problems and search for possibility to solve them and deal with realistic cases. 5. To give opportunity to students to think like a real engineer.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Select a topic for project so that either solve a problem or add innovative ideas. 2. Create a plan to achieve the project. 3. Determine problem statement and objectives. 4. Create a survey from literatures and analyze the data and create a good background about the projects. 5. assess the literate studies and determine weak and strength aspects in these studies. 6. Defend on the selected idea of the project 7. and their link to the selected literature studies. 8. Relate the acquired information with the previous acquired knowledge obtained from their study and based on area of the study.
Indicative Contents المحتويات الإرشادية	Indicative content includes the group of seminars and workshops to students and as following: 1. Guidance on how to select a project topic. 2. How to get the suitable idea of the topic. 3. Specifying a problem statement OR innovative statement. 4. Determine the objectives. 5. Guidance on how to plan for the selected project. 6. How to select the related literature studies to the selected project.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Supervisor support: the student should meet the supervisor to get guidance towards to the best. 2. Workshops: Different workshops related to the stages of development the project should be conducted.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	92	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	58	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Proposal defense**	2	25% (25)	2	LO #1, 3 and 5
	Oral Project Presentation	2	25% (25)	5	LO # 6
Summative assessment	**Final project 1 report**	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Guidance on how to select a project topic.
Week 2	Determining the final topic of the project
Week 3	continued
Week 4	Determining a problem statement and objectives
Week 5	Oral Project Presentation defense
Week 6	Guidance on how to plan for the selected project.
Week 7	How to select the related literature studies to the selected project.
Week 8	Collect literature review studies
Week 9	Collect literature review studies (updating the supervisor)
Week 10	Collect literature review studies (updating the supervisor)
Week 11	Collect literature review studies (updating the supervisor)
Week 12	Analyze literature studies
Week 13	Writing an introduction and presenting the literature review studies
Week 14	Writing an introduction and presenting the literature review studies
Week 15	**Submission a project 1 report**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Depend on selected topic	None
Recommended Texts	Depend on selected topic	None
Websites	Depend on selected topic	

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	**Structural steel design I**			**Module Delivery**	
Module Type	Core			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE700**				
ECTS Credits	5				
SWL (hr/sem)	**125**				
Module Level		4	**Semester of Delivery**		7
Administering Department		-	**College**	-	
Module Leader	Dr. Omar Riyadh Khaleel		**e-mail**	dr.omaralobaidi@gmail.com	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Dr. Mohanad Hatem	**e-mail**	mohshadhar@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	structural analysis II	**Semester**	6
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This module aims: 1. To enhance the knowledge of civil engineering students in sustainable structural steel design of steel structures including materials properties. 2. To provide the student with realization of the importance of selection the proper methods of design. 3. To educate the student in dealing with design problems and selecting the proper methods of solutions. 4. To use the current design practice in the industry of civil engineering. 5. To focus on sustainability aspect in design. 6. To use recent aspects of design with considering health and safety factors.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate the Engineering principles in steel structure design. 2. Propose concepts for common civil engineering structures of steel, particularly those related to buildings. 3. Apply the engineering principles to realistic cases. 4. Explicate the results of the design. 5. Design of Steel Structural Members. 6. Solve engineering problems that related to steel structures. 7. Appraise the sustainability, constructability and health and safety issues relevant to the design and construction of steel and composite structures. 8. Optimize structural steel sizes in simple and complex structures.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A- Introduction</u> • Specifications, loads, and methods of design and Building Codes. [8 hrs] <u>Part B- Tension Members</u> • Design of tension members. • Analysis of tension members. • Design of Tension Members Continued. [16 hrs] <u>Part C- Axially loaded compression members</u> • Design of axially loaded compression members. • Analysis of Axially Loaded Compression Members. • Design of column base-plates. • Analysis and design of beams. • Design of Beams; and Unsymmetrical Bending. [36 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Teacher-based learning: teacher explain lectures pre-class (lecture notes and videos) and in-class (traditional lecture) • Student-based learning: student will be asked to prepare presentation OR poster and react the interactive among students. • research-based learning: instructor will give students published paper to be discussed in class (open discussion class). • Instructor could give realistic cases or exercises in-class and post-class and ask student to solve these cases in order to enhance the critical thinking skills and improve the ability of students to do calculations. • Invite guest lecturer to update the students with modern steel structure industry. • Site visit to enhance the knowledge of students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	1 hr	15% (15)	5, 10	LO # 4 and 5
	Assignments	3 hr	15% (15)	8	LO # 2, 3 and 6
	Report	1 hr	10% (10)	6	LO # 1
Summative assessment	**Midterm Exam**	2hr	10% (10)	9	LO # 1-5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Module details presentation + Recap of Pre-requisite modules
Week 2	Introduction : Specifications, loads, and methods of design and Building, Building Codes and Design Criteria (ASTM)
Week 3	Mechanical Properties of Structural Steel (Variation of material properties, Characteristic strength, Design strength, other design values for steel, Corrosion and durability of steelwork, Brittle fracture, Residual stresses, Fatigue, Stress concentrations, Failure criteria for steel
Week 4	Tension Members: Design of tension members; Analysis of tension members Design of Tension Members Continued
Week 5	Analysis of tension members
Week 6	Design of Tension Members Continued
Week 7	Axially loaded compression members: Design of axially loaded compression members
Week 8	Analysis of Axially Loaded Compression Members
Week 9	Design of column base-plates
Week 10	Analysis and design of beams.
Week 11	Design of Steel Members (Combined Axial and Flexural Members)
Week 12	Continued
Week 13	Design of Beams; and Unsymmetrical Bending
Week 14	Continued
Week 15	**Recap**
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. McCormac, J., Csernak, S.F., (2012), "Structural steel design" (Diseño de acero estructural), Sta edición, Pearson, Boston, Mass., USA, ISBN: 978-0-13- 607948-4.	No
Recommended Texts	**1.** AISC, (2010), "Steel Construction Manual" (Manual de Construcción en Acero), 14ta edición, American Institute of Steel Construction. **2.** Salmon, C.G., Johnson, J., Malhas, F., (2009), "Steel Structures: design and behaviour, emphasizing LRFD" (Estructuras en Acero: diseño y comportamiento, énfasis LRFD), Sta edición, Pearson-Prentice Hall, Upper Saddle River, NJ, USA, ISBN: 978-013-20611-9-3 **3.** Brockenbrough, Merrit, F., (2006), "Structural Steel Designer 's 4.Handbook" (Manual del Diseñador de Acero Estructural), 4ta edición, 2006, Mc Grown-Hill. ISBN: 978-007-16666-5-7.	No
Websites	https://www.ideastatica.com/	

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 Information معلومات المادة الدراسية					
Module Title	**Sustainable Building**			**Module Delivery**	
Module Type	**Elective**			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**UICE705**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	4		**Semester of Delivery**	7	
Administering Department	Civil Engineering		**College**	College of Engineering	
Module Leader	Mostafa Waleed		**e-mail**	mostafa.waleed@aliraqia.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Dr.Saja Hadi Raheem		**e-mail**	Sajahadi22@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This module explores sustainability principles and their practical application in the construction industry. Topics include sustainable development, environmental impacts (resources, waste, energy, climate change), social impacts (Corporate Social Responsibility, responsible sourcing, poverty reduction), and assessment methods (indicators, life-cycle assessment, cost analysis). Through lectures, case studies, and discussions, students develop a comprehensive understanding of sustainability and its relevance to construction industry. They learn to evaluate sustainability performance and make informed decisions. This module equips students with the knowledge and skills to contribute to sustainable development and apply sustainable practices in transport infrastructure engineering and construction.
Module Learning	1. Understand the principles of sustainability and sustainable development.

Outcomes مخرجات التعلم للمادة الدراسية	2. Recognize the environmental impacts associated with construction industry, including resources, waste, energy, and climate change. 3. Identify the social impacts of construction projects, such as corporate social responsibility, responsible sourcing, poverty reduction, and alignment with sustainable development goals. 4. Apply assessment methods and systems to evaluate the sustainability performance of infrastructure projects, including the use of indicators, environmental life-cycle assessment, and life-cycle cost analysis. 5. Analyze and critically evaluate the sustainability practices within the civil engineering and construction industry. 6. Demonstrate the ability to make informed decisions and propose strategies to minimize negative environmental and social impacts and promote sustainable practices in construction projects. 7. Communicate effectively, both orally and in writing, on sustainability-related issues in the context of transport infrastructure engineering and construction. 8. Collaborate in teams to discuss, analyze, and propose sustainable solutions for complex challenges in the construction industry. Develop a heightened awareness of the importance of sustainability in transport infrastructure engineering and construction, and its role in contributing to sustainable development goals.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A- Introduction to Sustainability</u> • Definition of sustainability and its relevance to civil engineering and construction processes. • Principles of sustainable development and their application in the construction industry. • The role of civil in sustainable construction.[6hrs] <u>Part B-Sustainable Construction Practices</u> • Overview of sustainable construction practices and their impact on environmental and social sustainability. • Green building concepts, such as energy efficiency, renewable energy, and materials selection. [6hrs] <u>Part C- Environmental Impacts of Infrastructure Construction</u> • Examination of positive and negative environmental impacts associated with construction projects. • Resource utilization and waste management strategies. • Energy consumption, climate change, and mitigation measures in infrastructure construction. [6hrs] <u>Part D-Social Impacts of Infrastructure Construction</u> • Analysis of social impacts, including corporate social responsibility and ethical considerations. • Responsible sourcing and supply chain management. • Poverty reduction, community engagement, and adherence to sustainable development goals. [6hrs]

	Part E- Assessment Methods for Sustainability • Introduction to sustainability assessment frameworks and indicators. • Environmental life-cycle assessment (LCA) and its application in infrastructure construction. • Life-cycle cost analysis (LCCA) and its role in evaluating sustainable infrastructure projects. [7hrs] Part F- Sustainable Design and Decision Making • Strategies for integrating sustainability into the design process of transport infrastructure projects. • Multi-criteria decision-making techniques for evaluating sustainable options. • Balancing economic, environmental, and social considerations in decision making. [6hrs] Part G- Case Studies and Best Practices • Analysis of real-world case studies showcasing sustainable transport infrastructure projects. • Examination of best practices and lessons learned from successful sustainability initiatives. • Critical evaluation of challenges and opportunities in implementing sustainability in practice. [8hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module employs a range of teaching methodologies. Lectures deliver foundational knowledge on sustainability principles. Group discussions facilitate peer learning and critical thinking on environmental and social impacts. Project-based methods provide hands-on experience in applying sustainability concepts to real-world scenarios to assess and analyze various cases. Through these methodologies, students gain a comprehensive understanding of sustainability in construction industry, develop critical thinking and problem-solving skills, and enhance their ability to work collaboratively.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Presentations**	2	20% (20)	7 and 8	All
	Projects	1	10% (10)	14 and 15	LO #5, #6 and #7
	Report	2	10% (10)	Continuous	All
Summative assessment	**Midterm Exam**	1hr	10% (10)	9	LO #1 - #4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Sustainability
Week 2	Sustainable Construction Practices
Week 3	Environmental Impacts of Infrastructure Construction
Week 4	Energy consumption, climate change, and mitigation measures in infrastructure construction.
Week 5	Assessment Methods for Sustainability
Week 6	Group Discussion and preparation for presentation
Week 7	Students' 1st Presentation
Week 8	Students' 1st Presentation
Week 9	Mid-term Exam
Week 10	Social Impacts of Infrastructure Construction

Week 11	Case Studies and Best Practices
Week 12	Case Studies and Best Practices
Week 13	Group Discussion and preparation for the presentation
Week 14	Students' 2nd Presentation
Week 15	Students' 2nd Presentation
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Braham, Andrew. Fundamentals of Sustainability in Civil Engineering. CRC Press, 2017.	Yes
Recommended Texts	Yates, Janet K., and Daniel Castro-Lacouture. Sustainability in engineering des	
Websites	https://www.usgbc.org/resources	

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	**Transportation Engineering**			**Module Delivery**	
Module Type	Core			☒ **Theory** ☒ **Lecture** ☒**Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE703**				
ECTS Credits	5				
SWL (hr/sem)	**125**				
Module Level	4		**Semester of Delivery**	7	
Administering Department	-		**College**	-	
Module Leader	Dr. Mohammed Hadi Nahi		e-mail	mohammed.h.nahi@aliraqia.edu.iq	
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Ph.D.	
Module Tutor	-		e-mail	-	
Peer Reviewer Name	L. Ishraq Hameed Naser		e-mail	ishraq.hameed@aliraqia.edu.iq	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Traffic engineering	**Semester**	6
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To enable students to analyses road pavement structures. 2. To differentiate between the different types of materials used. 3. To design road pavements, the design concepts, material properties and performance criteria are used together with vehicle loading criteria to demonstrate to the students how they are combined to design and construct road pavements. 4. To distil the principles of geometric design, both vertical and horizontal. 5. To give the students the satisfaction of producing for themselves a full road pavement design, they are taken through one of the available methods and they perform examples so they can see how the principles and their application come together in a design.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Select the appropriate materials for use in different road layers 2. Evaluate the quality and performance of unbound and bound road materials 3. Perform road pavement design and analysis 4. Develop an appropriate road monitoring and maintenance program 5. Interpret geometric design fundamentals, in relation to safety and driver comfort, focusing on horizontal and vertical alignment 6. Design a road alignment.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Principles of highway location; Mass- haul diagram; Human factors, road characteristic: sight distance, Stopping sight distance, passing sight distance, decision sight distance Capacity and LOS.[10hrs] • Geometric Design: Element of design, Horizontal Alignment; Vertical Curve; Cross section and intersections; and Design principles for rural and urban alignment, super elevation. [12hrs] • 2. Unbound Flexible Pavement Materials – Capping and sub base materials [6hrs] • 3. Bitumen – Properties and laboratory tests for property characterization [6hrs] • 4. Bituminous Materials – Open textured macadam, hot rolled asphalt, mastic asphalt and dense bituminous macadam. [8hrs] • Flexible Pavement Design – Principles of design, design method and examples. [6hrs] • Rigid Pavements – Properties of concrete, rigid pavement design and construction. [6hrs] • Types of Rutting, Fatigue; racking and Low Temperature Cracking; Super pave Physical Tests for Asphalt. [6hrs] • 8. Concept of Mix Design, Variables and Objectives, Weight-Volume Relationships; Asphalt Binder Content Selection, The Super pave Gyratory Compactor (SGC); Material Characterization Tests, Marshall Test; and Hot Mix Asphalt (HMA) Tests. [11hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Teacher-based learning: teacher explain lectures pre-class (lecture notes and videos) and in-class (traditional lecture) • Student-based learning: student will be asked to prepare presentation OR poster and react the interactive among students. • Instructor could give realistic cases or exercises in-class and post-class and ask student to solve these cases in order to enhance the critical thinking skills and improve the ability of students to do calculations. • Invite guest lecturer to update the students with modern traffic control strategies.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	15% (15)	5, 10	LO #1, 2 and 3
	Assignments	2	10% (10)	2, 12	LO # 4
	Report (site visit)	1	5% (5)	13	LO # 5
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1, 2, 3, 5 and 6
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Principles of highway location; Mass- haul diagram; Human factors,
Week 2	road characteristic: sight distance, stopping sight distance, passing sight distance, decision sight distance
Week 3	Continued
Week 4	Capacity and LOS
Week 5	Geometric Design: Element of design, Horizontal Alignment; Vertical Curve; Cross section and intersections, super elevation
Week 6	Design principles for rural and urban alignment,
Week 7	Unbound Flexible Pavement Materials – Capping and sub base materials
Week 8	Bitumen – Properties and laboratory tests for property characterization
Week 9	Bituminous Materials – Open textured macadam, hot rolled asphalt, mastic
Week 10	Flexible Pavement Design – Principles of design, design method and examples
Week 11	Rigid Pavements – Properties of concrete, rigid pavement design and construction
Week 12	Types of Rutting, Fatigue; racking and Low Temperature Cracking; Super pave Physical Tests for Asphalt
Week 13	Concept of Mix Design, Variables and Objectives, Weight-Volume Relationships; Asphalt Binder Content Selection,
Week 14	The Super pave Gyratory Compactor (SGC); Material Characterization Tests,
Week 15	Marshall Test; and Hot Mix

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Coarse Aggregate (AASHTO T27-78 Sieve Analysis Of Fine) Absorption & Aggregate Specific Gravity
Week 2	Los Angelos Abrasion, Determination of soft plastics in gradient solids and soils by sanding equivalent method, Unit Weight of Aggregates
Week 3	Sampling Materials Bituminous , Flash and Fire Point Tester of Bituminous Materials
Week 4	Materials Of Penetration, Softening Point, Ductility test
Week 5	Kinematic Viscosity of Asphalt
Week 6	Preparation of Asphalt Concrete specimens using the Marshall Compactor
Week 7	Marshall Stability and flow of Asphalt Concrete
Week 8	Specific gravity Balance of Asphalt Cement
Week 9	California Bearing Ratio test
Week 10	Extraction Asphalt test

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Highway Engineering, M. Rogers, Blackwell Publishing Highway Engineering, CA O'Flaherty, Edward Arnold Highway Traffic Analysis and Design, RJ Salter and NB Hounsell, Macmillan	No
Recommended Texts	Principles of Highway Engineering and Traffic Analysis, FL Mannering and WP Kilareski, Wiley	No
Websites	https://www.mastersportal.com/disciplines/257/transportation-engineering.html	

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	**Airport Engineering**			**Module Delivery**	
Module Type	**Elective**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**UICE804**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	4		**Semester of Delivery**	8	
Administering Department			**College**		
Module Leader	Ishraq Hameed Naser		**e-mail**	hameed_ishraq@yahoo.com	
Module Leader's Acad. Title	lecturer		**Module Leader's Qualification**	MSC	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Dr.Mohammed Hadi		**e-mail**	mohammed.h.nahi@aliraqia.edu.iq	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Preparing high-level engineering cadres to support the urban movement and the tremendous growth witnessed by the public transport sector, roads and airports in particular. 2. Providing a solid educational level in airport engineering to enable students to acquire the scientific, technical and administrative capabilities in this specialization 3. To learn the geometric design characteristics of an airport including taxiways, aprons and runways, Orientation of a runway (wind rose analysis), Runway safety areas, the structural design of airport pavements and their estimation. 4. To understand the construction of airports and airport pavements, Airport drainage, Environmental Issues.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize Air Transport, Aircraft classifications used in airport design and Air Traffic Control. 2. The ability to practice professional work in the field of airport engineering in an ethical and professional manner. 3. Discuss The main elements of an airport master plan. 4. Applying runway safety & runway numbering 5. Applying The geometric design characteristics of an airport 6. Applying The structural design of airport pavements and their estimation, 7. Modeling an Airport drainage, Environmental Issues.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Introduction to Air Transport</u> Planning and choose Airport location, Aircraft classifications used in airport design. [7 hrs] <u>Part B – Air Traffic Control</u> _Airport Lighting, Marking and Signing, The main elements of an airport master plan [15 hrs] <u>Part C – The geometric design characteristics of an airport</u> taxiways, aprons and runways, Orientation of a runway (wind rose analysis), Runway safety areas, [20 hrs] <u>Part D – The structural design of airport pavements and their estimation</u> The construction of airports and airport pavements, Airport drainage, Environmental Issues. [20 hrs]

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2,and 4
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 7
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction to Air Transport, Planning and choose Airport location
Week 2	Aircraft classifications used in airport design
Week 3	Application , Airport Lighting
Week 4	Marking and Signing
Week 5	Application of 1st order ODEs; stress and strain (Hook's Law), and orthogonal trajectories
Week 6	The main elements of an airport master plan
Week 7	taxiways
Week 8	aprons and runways
Week 9	Orientation of a runway (wind rose analysis)
Week 10	Runway safety areas, Runway Numbering
Week 11	The construction of airports
Week 12	airport pavements
Week 13	Airport drainage
Week 14	Environmental Issues
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- Horonjeff. R. McKelvey.X., Sproule, W..&Young.S.(2010). Planning and design airports. (Five edition). New York: McGraw-Hill. 2- Ashford, N., and P. H. Wright. 1992. Airport Engineering, 3rd ed. New York: John Wiley & Sons.	NO
Recommended Texts	1- Ashford. N.J..Mumaiz. S..&Wright. P.H. (2011). Airport engineering : planning, design and development of 21st century airport. 2- John Wiley & Sons ICAO. Various Advisory Circular. 3- Alexander T. Wells, & Seth B. Young "Airport planning and Management" 5ed , McGrew Hill, 2004	NO
Websites	https://www.faa.gov/airports/engineering	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Bridge Design**			**Module Delivery**	
Module Type	**Elective**			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**UICE804**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		4	**Semester of Delivery**		8
Administering Department		-	**College**	Collage of engineering	
Module Leader	**Zainab Adel**		**e-mail**	Ezainab05@gmail.com	
Module Leader's Acad. Title		**Asst.Lecture**	**Module Leader's Qualification**		**M.Sc**
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Dr. Mohanad Hatem	**e-mail**	mohshadhar@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Improving student's skill in bridge design and improving their ability to comply with relevant codes and design specifications. 2. Explain the principles basic definitions and introductory concepts of bridge engineering. 3. Define AASHTO Specification and know how to use it in their study and after graduation. 4. Design some kinds of common Bridges. 5. Explain the principles of design loading and load effect. 6. Identify how to select the suitable bridge bearings according to type of bridge learning how to select expansion joints. 7. Identify the Construction Details in Bridges.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Analyze units, and basic principles. 2. Analyze loading and load effect. 3. Design of different types of concrete bridges (superstructures). 4. Identify and comply with relevant codes and specification. 5. Find out the way to design bearings of bridges. 6. Have the ability to select expansion joints.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A- Introduction</u> • Historical Overview of bridges. • Types of Reinforced Concrete Bridges. [6 hrs] <u>Part B- Basics for Design</u> • Classification of Bridges. • Basic data for design loading and load effect. • AASHTO Specification, AASHTO Truck Loading. • Design of Slab Deck Bridges. • Design of Girder – Deck Concrete Bridges. • Design of Composite Concrete Slab – Steel Girder Bridges. [48 hrs] <u>Part C- Bridges Details</u> • Construction Details in Bridges. • Bridge bearings; and expansion joints. [6 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1) Tutorials. 2) Homework and Assignments. 3) Tests and Exams. 4) Questions and Discussions. 5) Connection between Theory and Application. 6) Extracurricular Activities. 7) In- and Out-Class oral conservations. 8) Reports, Presentations, and Posters.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	3, 9	LO #1and 5
	Assignments	2	10% (10)	2,12	LO #3 and 4
	Report	1	5% (5)	5	LO # 2
Summative assessment	**Midterm Exam**	2 hr	15% (15)	14	LO # 1-9
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of bridge engineering.
Week 2	Classification of Bridges.
Week 3	Bridge planning and design.
Week 4	Materials for bridge construction.
Week 5	Loads and load distribution.
Week 6	AASHTO Specification.
Week 7	Design of Slab Deck Bridges.
Week 8	Solving problems.
Week 9	Design of Girder – Deck Concrete Bridges.

Week 10	Solving problems.
Week 11	Design of Composite Concrete Slab – Steel Girder Bridges.
Week 12	Solving problems.
Week 13	Reinforced and pre stressed concrete bridges.
Week 14	Expansion joints.
Week 15	Bridge bearings and substructures.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Lin, W., & Yoda, T. (2017). *Bridge engineering: classifications, design loading, and analysis methods*. Butterworth-Heinemann.	Yes
Recommended Texts	-Zhao, J. J., & Tonias, D. E. (2012). *Bridge engineering: design, rehabilitation, and maintenance of Modern Highway Bridges*. McGraw-Hill Education.	Yes
Websites	https://ftp.txdot.gov/pub/txdot-info/brg/design/bridge-design-guide.pdf https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/bridge-design-manual-lrfd	

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	**Foundation Engineering II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE801**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	**4**		**Semester of Delivery**	**8**	
Administering Department	-		**College**	-	
Module Leader	Bilal Muiassar M.Salih		**e-mail**	bilal.muasser@aliraqia.edu.iq	
Module Leader's Acad. Title	Lecture		**Module Leader's Qualification**	**PhD**	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	Asst.Lect. Mostafa Jamal		**e-mail**	E-mail	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Foundation Engineering I	**Semester**	7
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. An ability to produce engineering solutions to problems of foundation. 2. To learn about types and purposes of different foundation systems and structures. 3. Design and Analysis of Retaining Structures: a. Select proper earth pressure calculation method b. Calculate earth pressures for layered systems c. Evaluate the effects of water and drainage provisions d. Determine internal stability requirements of MSE walls 4. Ability to learn how to utilize their knowledge in soil mechanics to perform various types of engineering calculations. This includes consolidation analysis for foundations, and stability analysis of slopes and retaining walls. 5. Design and Analysis of Deep Foundations and Composite foundation (piled rafts, and basements) 6. Identify major deep foundation types. 7. Calculate skin and tip capacity of piles in clay and sand. 8. Specify pile material types for various applications. 9. Evaluate pile capacity in the field.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. An ability to identify geotechnical hazards and assess the risk of them occurring; 2. An ability to assess the forces acting on a foundation and the response of the soil to those forces. 3. An ability to produce engineering solutions to foundation problems. 4. To learn about types and purposes of different foundation systems and structures. 5. To provide students with exposure to the systematic methods for designing foundations. 6. To discuss and evaluate the feasibility of foundation solutions to different types of soil conditions considering the time effect on soil behavior. 7. To build the necessary theoretical background for design and construction of foundation systems
Indicative Contents المحتويات الإرشادية	• Lateral Earth Pressure Computations [18 hrs] • Retaining Walls and Sheet Piles [20 hrs] • Deep Foundation [4 hrs] • Single pile [28 hrs] • Pile Groups [28 hrs] • Efficiency of Pile Group [16 hrs] • Composite foundation – piled rafts, and basements [16 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1) Tutorials. 2) Homework and Assignments. 3) Tests and Exams. 4) In-Class Questions and Discussions. 5) Connection between Theory and Application. 6) Extracurricular Activities. 7) In- and Out-Class oral conservations. 8) Reports, Presentations, and Posters.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	3, 10	LO #1, 2, and 6
	Assignments	2	10% (10)	4, 7	LO #3 and 4
	Projects / Lab.				
	Report	1	10% (10)	12	LO # 6,7
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8,14	LO # 1-7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Define the lateral earth pressure and retaining structures, the types of lateral earth pressure, and calculate the total thrust on the retaining structures.
Week 2	Calculate the total thrust on the retaining structures.
Week 3	Stability of both rigid and flexible retaining walls.
Week 4	Introduce the classification of piles and types
Week 5	Bearing capacity of single pile using static methods.
Week 6	Ultimate bearing capacity of single pile using dynamic formula.
Week 7	Mid Exam1
Week 8	Introduce the different patterns of pile groups and estimate the bearing capacity of pile group
Week 9	Estimation of efficiency of pile group in different types of soil
Week 10	Pile foundations - Single piles
Week 11	Single piles - Dynamic analysis
Week 12	Pile foundations - Pile Groups
Week 13	sheet pile walls
Week 14	Mid Exam2
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Al-Shakarchi, Y. & N. Al-Mohamadi, (1985) "Foundation Engineering"	Yes
Recommended Texts	1. Bowles, J. E. (1996), "Foundation Analysis and Design", 5th edition Mc Graw-Hill Book Company Inc. New York. 2. Foundations and Earth Retaining Structures, M. Budhu, Wiley 3. Kaniraj S. R, “Design Aids in Soil Mechanics and Foundation Engineering”, Tata McGraw Hill. 4. Swami Saran, Gopal Ranjan, “Analysis & Design of Foundations & Retaining Structures”, Sarita Prakashan.	Yes

	5. Nainan P Kurian, “Design of Foundation Systems”, Narose Pub. House. 6. P. C. Varghese, “Foundation Engineering”, Prentice Hall of India Pvt. Ltd. 7. B. M. Das, “ Principles of Foundation Engineering” Eighth Edition,	
Websites	1. https://civilwale.com/types-of-foundation/ 2. https://www.civilengineeringforum.me/types-of-foundation/	

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	**Quantity Survey**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE803**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		4	**Semester of Delivery**		8
Administering Department		Civil Engineering	**College**	Type College Code	
Module Leader	Saja Hadi Raheem		**e-mail**	Sajahadi22@gmail.com	
Module Leader's Acad. Title		Lecture. Doctor	**Module Leader's Qualification**		Ph.D.
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Hiba Akram	**e-mail**	Hiba.akram.at@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The objective of this module is to give an overview of the three primary surveying professions' tasks and responsibilities. The course will be taught by the real estate management, quantity surveying, and building surveying course leaders. An overview of the surveying professions is given at the beginning of the module. It will give students a general knowledge and comprehension of the background, history, and RICS, as well as the different kinds of businesses where surveyors are employed. An outline of the surveyors' primary responsibilities will be provided, along with an explanation of their duties.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learn how to use the theories and methods used in quantity survey and contract management. 2. Study the role of the contemporary quantity surveyor, and gain a critical awareness of the construction lifecycle 3. Examine construction law and the commercial practices that affect the use, management and development of land 4. Develop an understanding of the interactions between a building and its internal and external environments. 5. Learn how effective planning and resource management can impact on a project and its supply chain. 6. Knowledge about Contract bid documents. 7. Recognize the theories and methods used in the quantity survey and contract management. 8. Explore how risk and value management techniques can optimize whole life cost solutions. 9. Benefit from field visits and real-world projects with our established built environment industry partnerships
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Introduction to quantity survey and its objectives. [3hrs] • Standard manual for quantity. [3hrs] • Principles of estimating and its purpose and benefits. [6hrs] • Types of estimation. [3hrs] • Procedure of estimating. [6hrs] • Method of building estimates. [3hrs] • Cost estimation. [6hrs] • Estimating quantities of items. [3hrs] • Estimating quantities of materials. [3hrs] • Contract management. [6hrs] • Road estimation. [6hrs] • Rules and methods of measurement. [6hrs] • Accounts and procedure of works; and Analysis of rates. [6hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Homework and Assignments. 2. In-Class Questions and Discussions. 4. Extracurricular Activities. 5. Seminars. 6. In- and Out-Class oral conservations. 7. Reports.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, 2 and 4
	Assignments	2	10% (10)	2 and 12	LO #3, 4 and #6, 7
	Attendance	15	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, 8
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	LO #1 - 6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to quantity survey and its objectives.
Week 2	Standard manual for quantity.
Week 3	Principles of estimating and its purpose and benefits.
Week 4	Types of estimation
Week 5	Procedure of estimating
Week 6	Method of building estimates
Week 7	Cost estimation
Week 8	Estimating quantities of items.
Week 9	Estimating quantities of materials.
Week 10	Contract management.
Week 11	Road estimation.
Week 12	Rules and methods of measurement.
Week 13	Continued
Week 14	Accounts and procedure of works; and Analysis of rates
Week 15	Continued
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Elements of Quantity Surveying)) Br: A.J Willis and C.J Willis, London (7th ed.) 2. Quantity Surveying for Buildings and Civil eng. Works.)) By: P.L Bhasin and S. Chand, New Delhi 1975. 3. Civil Estimating, Costing and Valuation)) By: Amarjit Aggarwal S.Kumar, New Delhi 19997. 4. Quantity Surveying and Costing 1& 2)) By G.C Malhotra, Khanna Publishers 1986.	Yes
Recommended Texts	1. Code of Practice for Project Management, Blackwell, The CHARTERD INSTUTE OF BUILDING.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Project in Civil Eng. II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**UICE802**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	4		**Semester of Delivery**	8	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr. Omar Riyadh Khaleel		e-mail	dr.omaralobaidi@gmail.com	
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Ph.D.	
Module Tutor	-		e-mail	-	
Peer Reviewer Name	Dr. Mohanad Hatim		e-mail	mohshadhar@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Project 2A	**Semester**	7
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This module aims: 1. Create a good platform for project student to prove their capability to link between learning of theoretical notion and practical expertise. 2. To educate the student on how to analyze the collected data. 3. To get knowledge on managing the research project. 4. To educate the student on how to solve engineering problem cases. 5. To enable the student to link between the theory and practical of engineering cases. 6. To give opportunity to students to think like a real engineer. 7. To apply strictly the health and safety aspects when conducting the research project on both laboratory and sites.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To relate the theoretical aspect with practical aspect and with literatures. 2. To implement the evaluating methods. 3. To manage and implement the plan of the research project. 4. To analyze and explain the collected data. 5. To interpret the research data. 6. To solve engineering problem cases. 7. To summarize findings in the reasonable way.
Indicative Contents المحتويات الإرشادية	Indicative content includes the group of seminars and workshops to students and as following: 1. Guidance on how to achieve the research project. 2. Encourage the student to enhance the skills in planning of the project, doing presentation, communication and how to defend the obtained findings. 3. Guidance on analysis of the results. 4. Guidance on how to interpret the findings. 5. Guidance and supervision on implementation of the research project.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Supervisor support: the student should meet the supervisor to get guidance towards to the best research project. 2. Workshops: Different workshops related to the stages of development the project should be conducted.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	92	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	108	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Progress of the report**	2	25% (25)	8	LO # 2 and 3
	Oral Project Presentation	2	25% (25)	14	LO # 1-7
Summative assessment	**Final project 2report**	2hr	50% (50)	14	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Guidance on how to achieve the research project.
Week 2	Guidance on set the plan for the project.
Week 3	Preparing the implementation means of the research projects.
Week 4	Supervising on implementation of Practical and experimental work
Week 5	Writing the methodology of the research project,
Week 6	Implementation of the research project plan
Week 7	Implementation of the research project plan
Week 8	Submission of a progress report
Week 9	Collecting and analysis of the research data (updating the supervisor)
Week 10	Start writing the discussion and interpretation of the collected findings

Week 11	Start writing the discussion and interpretation of the collected findings
Week 12	Start writing the discussion and interpretation of the collected findings
Week 13	Start writing the discussion and interpretation of the collected findings
Week 14	**Submission a project 1 report and presenting the achieved work**
Week 15	**Revision by supervisor**
Week 16	**Final viva**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Reading	Final Year Project Guide	None
Recommended Texts	Depend on selected topic	None
Websites	Supportive website will be given during the semester.	

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	**Structural steel design II**			**Module Delivery**	
Module Type	Core			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE800**				
ECTS Credits	6				
SWL (hr/sem)	**150**				
Module Level		4	**Semester of Delivery**		8
Administering Department		-	**College**	-	
Module Leader	Dr. Omar Riyadh Khaleel		**e-mail**	dr.omaralobaidi@gmail.com	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		Dr. Mohanad Hatem	**e-mail**	mohshadhar@gmail.com	
Scientific Committee Approval Date		11/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	**Structural steel design I**	**Semester**	7
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This module aims: 1. to enhance the knowledge of civil engineering students in sustainable structural steel design of steel structures including materials properties. 2. To provide the student with realization of the importance of selection the proper methods of design. 3. To educate the student in dealing with design problems and selecting the proper methods of solutions. 4. To use the current design practice in the industry of civil engineering. 5. To focus on sustainability aspect in design. 6. To use recent aspects of design with considering health and safety factors.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Design of Steel Structural Members. 2. Solve engineering problems that related to steel structures. 3. Consider Health and Safety Aspects to the steel structures design. 4. Explain steel design and analysis through lab practical and design assignments. 5. Analyses and design simple steel girders for flexure and buckling. 6. Analyses and design simple steel girders for shear. 7. Analyses and design bolted and steel connections. 8. Analyses beam-columns and frames.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A- Combined Stresses • Design for Axial Compression and Bending. • Moment Amplification and Modification in Beam – Columns. • Design of Beam- Columns by the ASD Formulas. • Pipe and Structural Tube Beam- Columns. • Cover-plated beams and built-up girders (plate girder) • Design of Bearing Stiffeners. Part B- steel connectors • Bolted Connections. • Welded Connections. • Building connections. • Eccentricity loaded bolted and welded connections.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Teacher-based learning: teacher explain lectures pre-class (lecture notes and videos) and in-class (traditional lecture) • Student-based learning: student will be asked to prepare presentation OR poster and react the interactive among students. • research-based learning: instructor will give students published paper to be discussed in class (open discussion class). • Instructor could give realistic cases or exercises in-class and post-class and ask student to solve these cases in order to enhance the critical thinking skills and improve the ability of students to do calculations. • Invite guest lecturer to update the students with modern steel structure industry. • Site visit to enhance the knowledge of students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Module details presentation + Recap of Pre-requisite modules
Week 2	Combined Stresses; Design for Axial Compression and Bending
Week 3	Moment Amplification and Modification in Beam – Columns
Week 4	Design of Beam- Columns by the ASD Formulas
Week 5	Continued
Week 6	Pipe and Structural Tube Beam- Columns
Week 7	Continued
Week 8	Pipe and Structural Tube Beam- Columns
Week 9	Cover-plated beams and built-up girders (plate girder)
Week 10	steel connectors: Bolted Connections
Week 11	welded Connections
Week 12	Building connections
Week 13	Eccentricity loaded bolted and welded connections
Week 14	Continued
Week 15	Recap

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. McCormac, J., Csernak, S.F., (2012), "Structural steel design" (Diseño de acero estructural), Sta edición, Pearson, Boston, Mass., USA, ISBN: 978-0-13- 607948-4.	No
Recommended Texts	**1.** AISC, (2010), "Steel Construction Manual" (Manual de Construcción en Acero), 14ta edición, American Institute of Steel Construction. **2.** Salmon, C.G., Johnson, J., Malhas, F., (2009), "Steel Structures: design and behaviour, emphasizing LRFD" (Estructuras en Acero: diseño y comportamiento, énfasis LRFD), Sta edición, Pearson-Prentice Hall, Upper Saddle River, NJ, USA, ISBN: 978-013-20611-9-3 **3.** Brockenbrough, Merrit, F., (2006), "Structural Steel Designer 's 4.Handbook" (Manual del Diseñador de Acero Estructural), 4ta edición, 2006, Mc Grown-Hill. ISBN: 978-007-16666-5-7.	No
Websites	https://www.ideastatica.com/	

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	**Theory of Structures**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UICE500**				
ECTS Credits	**5**				
S.W.L. (hr/sem)	**125**				
Module Level	3		**Semester of Delivery**	5	
Administering Department	N/A		**College**		
Module Leader	Lec.Yasir Wisam Abduljaleel		**e-mail**	yasiraliris@gmail.com	
Module Leader's Acad. Title	Lecture		**Module Leader's Qualification**	Master	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	**Aseel Qadoorri**		**e-mail**	aseel20071984@gmail.com	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mechanics of Materials I & Mechanics of Materials II	**Semester**	3,4
Co-requisites module	Eng. Mechanics-Statics & Eng. Mechanics-Dynamics	**Semester**	1,2

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

Module Aims أهداف المادة الدراسية	1. **Basic Understanding of Structures**: To introduce students to the fundamental principles of structural engineering, including the types of structures (like beams, trusses, and frames) and how they resist loads. 2. **Concepts of Statics**: To develop a thorough understanding of the basic concepts of statics, including force vectors, moments, equilibrium conditions, and free-body diagrams. 3. **Load Calculations**: To train students in understanding and calculating different types of loads that act on structures, such as dead loads, live loads, wind loads, and earthquake loads. 4. **Analysis Techniques**: To introduce students to the basic methods used for analyzing structures. 5. **Reactions and Internal Forces**: To train students in determining reactions and internal forces in statically determinate structures. 6. **Deflection Analysis**: To help students understand how structures deform under loads and how to calculate deflections in beams and trusses. 7. **Influence Lines**: To introduce students to the concept of influence lines and their use in determining maximum structural response due to moving loads. 8. **Structural Stability and Determinacy**: To impart knowledge about the concepts of stability, determinacy, and indeterminacy of structures. 9. **Real-world Applications**: To expose students to real-world examples and case studies to illustrate how the principles of structural analysis are applied in professional practice.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introduction To Structural Analysis 2. Analysis Of Statically Determinate Structures (Axial Force, Shear Force and Bending Moment Diagrams of Beams;Frames,Arches,Composite Structures 3. Analysis Of Statically determinate Trusses of Simple Trusses,Combined Trusses, Complex Trusses. 4. Influence Lines and moving load -Influence Lines for Beams -Influence Lines for Girder Floor Beams Stringers System -Influence Lines for Trusses -Influence Lines for Composite Structures. 5.Absolute Max. Bending Moment in Simply Supported Beams due to Series of Moving Loads. 6.Approximate Analysis Of Indeterminate Structures 1. Portal Method 2. Cantilever Method 3. Trusses
Indicative Contents المحتويات الإرشادية	Indicative Content Includes The Following: **<u>Part A - Introduction To Structural Analysis(5hr.):</u>** • Definition And Objectives Of Structural Analysis • Role Of Structural Analysis In Civil Engineering • Types Of Structures And Their Behavior • Equilibrium Of Forces And Moments • Support Reactions And Their Determination **<u>Part B - Analysis Of Statically Determinate Structures (Axial Force, Shear Force and Bending Moment Diagrams (20hr.):</u>** • Analysis Of Beams

	• Analysis Of Frames • Analysis Of Arches • Analysis Of Composite Structures **Part C - Analysis Of Statically determinate Trusses (10hr.)** • Simple Trusses. • Combined Trusses. • Complex Trusses. **Part D- Influence Lines(15hr.):** • Influence Lines for Beams • Influence Lines for Girder Floor Beams Stringers System • Influence Lines for Trusses • Influence Lines for Composite Structures. • Absolute Max. Bending Moment in Simply Supported Beams due to Series of Moving Loads. **Part E - Approximate Analysis Of Indeterminate Structures(10hr.):** • Portal Method • Cantilever Method • Trusses

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1) Tutorials. 2) Homework and Assignments. 3) Tests and Exams. 4) In-Class Questions and Discussions. 5) Connection between Theory and Application. 6) Extracurricular Activities. 7) In- and Out-Class oral conservations. 8) Reports, Presentations, and Posters.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Formative assessment	**Quizzes**	2	10% (10)	4,5, 8,9,10,11	L.O. #2,5 and 4
	Assignments	2	10% (10)	2, 12	L.O. # 1,6
	Projects	1	10% (10)	Continuous	All
	Report	1	10% (10)	12-15	L.O. # 3
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	L.O. # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Review Of Reaction, Types Of Structure, Types Of Loadings And Load Combinations.
Week 2-3	Stability And Determinacy Of Beams, Trusses And Frames,Arches,Composite Structure.
Week 4-5	Analysis Of Determinate Beams And Frames, Arches,Composite Structure Including (A.F.D, S.F.D., And B.M.D).
Week 6	Analysis Of Determinate Trusses (Simple Trusses, Combined Trusses, Complex Trusses).
Week 7	Mid Exam • Requirements for linear-elastic analysis • Principle of superposition • Qualitative analysis • Statically indeterminate structures • Force (flexibility) method • Slope-deflection and moment distribution • Displacement (stiffness) method • Influence lines • Introduction to plasticity theory and non-linear analysis
Week 8-9-10	Influence Lines and Moving Load Influence Lines for Beams • Influence Lines for Girder Floor Beams Stringers System • Influence Lines for Trusses • Influence Lines for Composite Structures
Week 11	Absolute Max. Bending Moment in Simply Supported Beams due to Series of Moving Loads.
Week 12-15	Approximate Analysis Of Indeterminate Structures: • Portal Method • Cantilever Method • Trusses

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	**Fundamentals of Structural Analysis**	Yes

	(Fifth Edition) by Kenneth M. Leet et al. 2018	
Recommended Texts	**structural analysis** (Eighth Edition) by R.C. Hibbeler 2012	Yes
Websites	https://www.udemy.com/course/structural-analysis-i/	

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)	**F.X.** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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