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



# Academic Program and Course Description Guide

## Introduction:

The educational program is a well–planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

#### **Concepts and terminology:**

<u>Academic Program Description</u>: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

**Course Description:** Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

**<u>Program Vision</u>**: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

**<u>Program Mission</u>**: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

**<u>Program Objectives</u>**: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

**Curriculum Structure:** All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

**Learning Outcomes:** A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

<u>Teaching and learning strategies</u>: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

#### **Academic Program Description Form**

University Name: Mosul University
Faculty/Institute: College of Engineering
Scientific Department: Environmental. Engineering
Academic or Professional Program Name: Environmental Engineering
Final Certificate Name: BSc. of science in Environmental Engineering
Academic System: Course System + Bologna Process
Description Preparation Date: March, 2024
File Completion Date: March, 2024

Signature: Head of Department Name: Signature: Scientific Associate Name:

Date:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department: Date:

Signature:

Approval of the Dean

#### 1. Program Vision

Leadership and excellence in environmental engineering in education, research, and application

#### 2. Program Mission

Consolidating the role of environmental engineering in community, raising the level of the graduate and developing his ability to compete in the labor market with high professionalism and employing it in achieving comprehensive and sustainable development

#### 3. Program Objectives

1-Our graduates will perceive engineering knowledge and skills that help them to advance their career in the field of environmental engineering

2-Our graduates will establish themselves as practicing engineers in the field of environmental engineering, civil engineering and other related domains

3-Our graduate will be provided by creative knowledge to fulfill the need of society

#### 4. Program Accreditation

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

#### 5. Other external influences

Deanship of Engineering College

6. Program Structure												
Program Structure	Number of	Credit hours	Percentage	Reviews*								
	Courses											
Institution	12	23	13 7									
Requirements	12	23	13.7									
College	12	25	14 9									
Requirements	12	23	14.9									
Department	13	120	71 /									
Requirements	45	120	/1.4									
Summer Training	1											
Other												

7. F	Program	Description		
Year/	Course	Course Name	Credit H	ours
Level	Code		Theoretical	Practical
	ENV111	Mathematics	3	
	ENV112	Statics	3	
	ENV113	Engineering Drawing	3	3
	ENV114	Environmental Thermodynamics	3	
	ENV115	Statistics	2	
	UOM101	Arabic	2	
1	UOM104	Democracy and Human Rights	2	
	ENV121	Calculus	3	
	ENV122	Dynamics	2	
	ENV123	Principles of Environmental Engineering	2	
	ENV124	Environmental Geology	2	
	ENV125	Drawing by Computer	1	3
	UOM103	Computer	1	2
	UOM102	English I	2	
	UOMC ENCC227	English language pre-intermediate	2	
	ENGC227	Statistics	2	
	EINV240	Engineering mathematics	4	2
	$\frac{EINV241}{ENV242}$	Dringing of anyironmental angingering	4	3
	$\frac{EINV242}{ENV243}$	Strongth of materials	2	
	EINV243	Construction materials	1	2
	ENV244	Remote sensing	2	2
2	LIUZ	Flectrical installation	2	
	ENV246	Engineering analysis	2	
	ENV247	Fluid Mechanics	3	2
	ENV248	Water quality engineering	2	2
	ENV249	GIS applications	1	2
	ENV250	Building construction	2	
	ENV251	Hydrology	3	
	ENV252	Microbiology	2	2
	ENG329	Public safety	2	
	ENG320	Numerical analysis	2	
	ENV340	Water supply networks	3	
	ENV341	Hydraulic applications	3	
	ENV342	Soil mechanics	3	2
	ENV343	Air pollution	3	
	ENV344	Wastewater engineering	2	
3	ENV345	Engineering research	2	
	UOMC	English language - intermediate	2	
	ENV346	Sanitary Sewer networks	3	
	ENV347	Foundation engineering	3	
	ENV348	Water chemistry	3	
	ENV349	Keinforcement concrete	3	
	ENV350	Solid Waste	4	
	EIN V 390	Noise pollution	2	
	ENG425	Engineering management	2	
4	ENG430	Drinking water treatment	∠	
	EIN V 44U ENIV 4 4 1	Westewater treatment design	4 A	
L	EIN V 441	wasiewater treatment design	4	

ENV442	Environmental construction design	3	
ENV443	Air pollution control	3	
ENV444	Engineering project 1	2	
UOM	English language -advanced	2	
ENG426	Engineering economic	2	
ENV445	Industrial and petroleum wastewater	4	
ENV446	Soil and ground water pollution	3	
ENV447	Construction drawing	2	
ENV448	Estimation	2	
ENV449	Engineering project 2	2	
ENV490	Advanced water supply	2	

8. Expected learning outcomes of the program									
	Knowledge								
	A1-An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.								
Learning Outcomes ( <b>A</b> )	A2-An ability to apply the engineering design process to produce solutions that meet specified needs with consideration for public health and safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline								
	A3-An Ability to applying both analysis and synthesis in the design process.								
	<b>A4</b> -An ability to function effectively as a member or leader of a team that establishes goals, plans task, meets deadlines, and creates a collaborative and inclusive environment								
	Skills								
	<b>B1</b> -An ability to develop and conduct appropriate experimentation, analyze and interpret data								
	<b>B2</b> -An ability to using engineering judgment to draw conclusions								
Learning Outcomes <b>(B)</b>	<b>B3</b> -An ability to skillfully communicate orally with a gathering of people and in writing with various managerial levels.								
	<b>B4</b> -An ability to perceive the continual necessity for professional knowledge growth and how to find, assess, assemble and apply it properly.								
	Ethics								
	C1-An ability to recognize ethical and professional responsibilities in engineering situations								
Learning Outcomes <b>(C)</b>	<b>C2</b> -An ability to make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts								
	C3-An ability to set up objectives, plan activities, meet due dates, and manage risk and uncertainty								
	<b>C4</b> -The ability to ensure the quality of environmental engineering works by adhering to engineering specifications.								

#### 9. Teaching and Learning Strategies

- Power point lectures
- Tutorial
- Laboratory experiments
- Computer laboratories
- Video lectures
- Team works
- Case Studies
- On-line lectures

#### **10. Evaluation methods**

- Mid-Term and final exams
- Quizzes
- Reports
- · Laboratory exams
- Projects and technical reports

#### 11. Faculty

Faculty Members	i						
Academic Rank		Specialization	Spe Requirem (if app	ecial ents/Skills licable)	Number of the teaching staff		
	General	Special			Staff	Lecturer	
Professor	Civil Engineering	Environmental Engineering			1		
Assist. Professor	Civil Engineering	Environmental Engineering			2		
Assist. Professor	Civil Engineering	Geotechnique			1		

Lecturer	Civil	Environmental		9	
	Engineering	Engineering		-	
	Civil			_	
Lecturer	Engineering	Structural Engineering		5	
	Civil	Castachnimus		1	
Lecturer	Engineering	Geotechnique		1	
	Civil	Environmental			
Assist. Lecturer	Engineering	Engineering		5	
	Civil			1	
Assist. Lecturer	Engineering	Structural Engineering		1	
	Computer				
Assist. Lecturer	Engineering	Computer Engineering		1	

#### **Professional Development**

#### Mentoring new faculty members

The academic program aims to strengthen the knowledge of new faculty members in various educational fields, starting with the ability to manage the course and ending with the processes and procedures that ensure the achievement of the targeted learning outcomes in the various programs. This can be achieved through:

• Holding educational courses for new faculty members to improve the quality of the educational learning process, which are: training on teaching methods, designing courses outlines, modern trends in university teaching, evaluating student learning, and preparing tests, in addition to the university's laws, regulations, instructions, and e-learning.

• Continuous evaluation of teaching staff members, full and partial-time faculty, to direct them to the areas they need to develop during their educational career

• Urging full and partial-time faculty to participate in teaching staff development courses held by the department or the continuing education unit at the university.

#### Professional development of faculty members

Continuous Learning Committee of Environmental Engineering Department organizes lectures and workshops for faculty members in various fields. The professional development activities held in the past five academic years are listed as follows:

- ✓ Development of education methods and E-learning/ 9
- ✓ Scientific publications/44
- ✓ Academic accreditation/2
- ✓ Miscellaneous seminars in the environmental engineering field/47
- $\checkmark$  Participation in conferences, seminars, workshops, and training courses outside Iraq/2
- ✓ Participation in conferences, seminars, workshops, and training courses inside Iraq/26

The faculty members actively participate in various workshops and training courses that fit their teaching, quality, and research skills. Last five academic years, eighteen faculty members presented a total skills development (10 workshops/13 continuous education courses). The department encourages faculty members to attend conferences, seminars, workshops, and training courses for professional development. Within the past five academic years, nine of faculties participated (as a Lecturer) in a total of 3 conferences and 3 symposiums. Regarding postgraduate studies, we would like to note that there are no postgraduate studies in the department yet.

#### 12. Acceptance Criterion

The announced central admission results are based on the official website of the Ministry, and the announcement is a formal notice to the department to begin registering students on the day following the announcement of the results, and the registration period continues within a period of 15 (working days) starting from the date of register.

The students' files were received by the registration unit in the department and contain the documents required above, and they were checked by the registration unit.

The capacity of the Environmental Engineering Department is determined within the admission plan, where the committee determines the flag that indicates the number of new students required to be accommodated, then it is sent to the deanship, then the university, and then the ministry to obtain approval.

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

Guidebook for Mosul University
 The departmental website:

#### http://uomosul.edu.iq/pages/en/engineering/46848

#### 14. Program Development Plan

To improve the quality of education, promote the graduates' outcomes, and to meet the competencies requirements of increasingly complex societies, the department council decided to follow "Bologna process system of Education" which appropriate the European Credit Transfer and Accumulation System (ECTS) of study instead of courses system as a result of the policy of continuous improvement adopted by the department. Indeed, the new system of study will be launched since 2023–2024

The Bologna has been introduced with the expectation of maintaining the flowing advantages:

- It improves the education system by putting the student in the center of the learning process (Student- Centered Learning)
- More emphasis is laid on class interaction because of constant engagement between teachers and students
- There is an emphasis on gaining professional and practical skills during the study
- It will provide an opportunity to the students for continuous learning, assessment and feedback.
- It facilitates in evaluating the performance of students twice a year.
- It facilitates a better understanding of the subjects.

	Program Skills Outline														
							Req	uired	progr	am Le	earnin	g outcon	ies		
Year/Level	Course Code	Course Name	Basic or	Knov	vledge			Skills	S			Ethics			
			optional	A1	A2	A3	A4	B1	B2	<b>B3</b>	<b>B4</b>	C1	C2	С3	C4
	ENV111	Mathematics	Basic	*		*									
	ENV112	Statics	Basic	*		*									
	ENV113	Engineering Drawing	Basic	*		*		*			*				
	ENV114	Environmental Thermodynamics	Basic	*		*									
	ENV115	Statistics	Basic	*		*									
	UOM101	Arabic	Basic	*		*				*					
1	UOM104	Democracy and Human Rights	Basic									*			
	ENV121	Calculus	Basic	*		*									
	ENV122	Dynamics	Basic	*		*									
	ENV123	Principles of Environmental Engineering	Basic	*	*	*									*
	ENV124	Environmental Geology	Basic	*		*									

	ENV125	Drawing by Computer	Basic	*		*			*		
	UOM103	Computer	Basic					*	*		
	UOM102	English 1	Basic					*	*		
	UOMC	English language pre-intermediate	Basic					*	*		
	ENGC227	Statistics	Basic	*		*					
	ENV240	Engineering mathematics	Basic	*		*					
	ENV241	Engineering surveying	Basic	*		*	*				
2	ENV242	Principles of environmental engineering	Basic	*	*	*					
	ENV243	Strength of materials	Basic	*		*					
	ENV244	Construction materials	Basic	*		*	*				
	ENV245	Remote sensing	Basic	*		*	*		*		
	UOMC	Electrical installation	Optional	*		*					
	ENV246	Engineering analysis	Optional	*		*					

	ENV247	Fluid Mechanics	Basic	*		*						
	ENV248	Water quality engineering	Basic	*		*	*					
	ENV249	GIS applications	Basic	*	*	*	*					
	ENV250	Building construction	Basic	*		*	*			*		
	ENV251	Hydrology	Basic	*		*						
	ENV252	Microbiology	Basic	*		*						
	ENG329	Public safety	Basic	*					*			*
	ENG320	Numerical analysis	Optional	*		*						
	ENV340	Water supply networks	Basic	*	*	*						
3	ENV341	Hydraulic applications	Basic	*		*						
	ENV342	Soil mechanics	Basic	*		*	*	*				
	ENV343	Air pollution	Basic	*		*						
	ENV344	Wastewater engineering	Basic	*		*						

	ENV345	Engineering research	Basic					*	*		*	*	*	
	UOMC	English language - intermediate	Basic						*	*				
	ENV346	Sanitary Sewer networks	Basic	*	*	*		 						
	ENV347	Foundation engineering	Basic	*	*	*								
	ENV348	Water chemistry	Basic	*		*								
	ENV349	Reinforcement concrete	Basic	*	*	*								
	ENV350	Solid waste	Basic	*	*	*								
	ENV390	Noise pollution	Optional	*	*	*	*							
	ENV391	Thermal and Radioactive pollution	Optional	*	*	*	*							
	ENG425	Engineering management	Basic	*		*			*	*	*	*	*	*
4	ENG436	Sustainable environmental engineering	Optional	*		*								
	ENV440	Drinking water treatment	Basic	*	*	*								

ENV441	Wastewater treatment design	Basic	*	*	*	*								
ENV442	Environmental construction design	Basic	*	*	*									
ENV443	Air pollution control	Basic	*	*	*									
ENV444	Engineering project 1	Basic	*	*	*	*	*	*	*	*	*	*	*	*
UOM	English language - advanced	Basic							*	*				
ENG426	Engineering economic	Basic	*		*									
ENV445	Industrial and petroleum wastewater	Basic	*	*	*									
ENV446	Soil and ground water pollution	Basic	*	*	*									
ENV447	Construction drawing	Basic	*	*			*			*				*
ENV448	Estimation	Basic	*		*						*	*	*	*
ENV449	Engineering project 2	Basic	*	*	*	*	*	*	*	*	*	*	*	*
ENV490	Advanced water supply	Optional	*	*	*									

## MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

	Module Information معلومات المادة الدر اسية												
Module Title		Mathematic		Modu	le Delivery								
Module Type	Suppor	t or related learning act	ivity		🛛 Theory								
Module Code		ENV111		□ Lecture □ Lab									
ECTS Credits		6		🛛 Tutorial									
SWL (hr/sem)		150		Seminar									
Module Level		1	Semester o	f Deliver	y	1							
Administering De	partment	ENV8	College	ENG4									
Module Leader	Mayada Hazim	1	e-mail	<u>mayada</u>	ı.hmah@uomosı	<u>ıl.edu.iq</u>							
Module Leader's	Acad. Title	Lecturer	Module Lea	ader's Qu	alification	M.Sc.							
Module Tutor	Abeer Khalil Ib	prahim	e-mail	<u>abeer.a</u>	lsaraf@uomosul	.edu.iq							
Peer Reviewer Na	me	Mayada Hazim	e-mail	mayada	a.hmah@uomosu	ıl.edu.iq							
Scientific Commit Date	tee Approval	7/11/2023	Version Nu	mber	2.0								

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 الدر اسية ونتائج التعلم والمحتويات الإرشادية				
<b>Module Objectives</b> أهداف المادة الدر اسية	The aim of this course is to introduce the students to main topics of mathematic. The course will cover Prerequisites for mathematic, Limits, Continuity, and Differentiation (methods and applications), Matrices, Operations on matrices, and Solution of system of equations by matrix. At the end of the course, students will have a broad knowledge of the basic concepts, techniques and applications of Differentiation and Matrices. This will be achieved through theoretical lectures, tutorials and homework				
	Important: Write at least 6 Learning Outcomes, better to be equal to the				
Module Learning Outcomes مخرجات التعلم للمادة الدر اسية	<ul> <li>number of study weeks.</li> <li>CLO-1: Recognize fundamentals of math and the emphasis on functions and graphs(i).</li> <li>CLO-2: understanding various limit problems both algebraically and graphically and using it by checking the continuity of various types of functions(i).</li> <li>CLO-3: Finding the derivative of various types of functions using the differentiation rules (i).</li> <li>CLO-4: Appling differentiation to find linear approximation and optimization problems(ii)</li> </ul>				
	solving linear equations(i).				
Indicative Contents المحتويات الإرشادية	Indicative content includes the following.Part A – Prerequisites for calculusCoordinates and Graphs in the Plane, Slope and Equations for Lines,Functions and Their Graphs, Shifts, Circles and Parabolas, A Review ofTrigonometric Functions (17 hrs).Part B – Limits and ContinuityLimits and ContinuityLimits and ContinuityLimits, The Sandwich Theorem and (sin $\theta$ )/ $\theta$ , Limits Involving Infinity,Continuous Functions. (10 hrs).Part C – DerivativesSlope, Tangent Lines, and Derivatives, Differentiation Rules, Velocity,Speed and Other Rate of Change, Derivatives of Trigonometric Functions,The Chain Rule, Implicit Differentiation and Fractional Powers, LinearApproximations and Differentials (17 hrs).Part D - Applications of DerivativesRelated Rates of Change, Maximal, Minima and the Mean Value Theorem,Curve Sketching with y', y'', Graphing Rational Functions-Asymptotes andDominant Terms, Optimization (18 hrs.).				

Part E - Matrices Operation on matrices, Equal matrices, Addition and Subtraction of matrices, Multiplication by scalar, Multiplication of matrices, Transpose of a matrices, adjoin of a square matrix, Determinants, Properties of determinants, Singular matrix, Solution of system of equations by matrix inversion, Gamer's rule to solve the system of equations, Gaussian elimination. (18hrs).				
Learning and Teaching Strategies استر اتبحيات التعلم و التعليم				
Strategies الاستراتيجيات	Expanding students' perceptions of mathematic, familiarity with basic mathematical concepts and principles, and the ability to distinguish between different mathematical concepts. This course has several components that include studying lectures, tutorial, discussion, homework, and e-learning platforms. The course will be taught in English, and all compulsory assignments have to be submitted within the deadlines to be admitted to the exam.			

Student Workload (SWL)						
۲ السبوعا Structured SWI (b/sem)	الحمل الذر اسي للطالب محسوب لـ ١٥ اسبو عا 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -					
الحمل الدر اسي المنتظم للطالب خلال الفصل	80	الحمل الدراسي المنتظم للطالب أسبو عيا	5.5			
Unstructured SWL (h/sem) الحمل الدر اسي غير المنتظم للطالب خلال الفصل	70	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبو عيا	4.7			
Total SWL (h/sem) 150 الحمل الدر اسي الكلي للطالب خلال الفصل		150				

Module Evaluation								
تقييم المادة الدر اسية								
		Time/Number Weigh	Weight (Marks)	Week Due	Relevant Learning			
					Outcome			
	Quizzos	Г	5% (25)	3, 5, ,8,11	CLO-1, CLO-2, CLO-3,			
	Quizzes	5	570 (25)	and 14	CLO-4, CLO-5			
	Online	1	2% (2)	6				
Formative	Assignments	1	270 (2)	0				
assessment	Onsite	Б	2% (10)	3, 6, 9, 12	CLO-1, CLO-2, CLO-3,			
	Assignment	5	270 (10)	and 15	CLO-4, CLO-5.			
	Projects / Lab.	0	0	0				
	Report	1	3% (3)	12	CLO-1, CLO-2, CLO-3,			

					CLO-4.
Summative	Midterm Exam	2hrs	10% (10)	9	CLO-1, CLO -2, CLO -3,
assessment	Final Exam	3hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

	Delivery Plan (Weekly Syllabus)					
	المنهاج الأسبوعي النظري					
	Material Covered					
Week 1	Coordinates and Graphs in the Plane, Slope and Equations for Lines.					
Week 2	Functions and Their Graphs, shifts, circles and parabolas.					
Week 3	A review of trigonometric functions.					
Week 4	Limits, the sandwich theorem and $(\sin \theta)/\theta$ , limits involving infinity.					
Week 5	Continuous functions.					
Week 6	Slope, tangent lines, and derivatives, differentiation rules, velocity, speed and other rate of change.					
Week 7	Derivatives of trigonometric functions.					
Week 8	The chain rule, implicit differentiation and fractional powers, linear approximations and differentials.					
Week 9	Related rates of change.					
Week 10	Maximal, minima and the mean value theorem, curve sketching with $y', y''$ .					
Week 11	Graphing Rational Functions-Asymptotes and Dominant Terms.					
Week 12	Optimization.					
Week 13	Operation on matrices, Equal matrices, Addition and Subtraction of matrices, Multiplication by scalar, Multiplication of matrices,					
Week 14	Transpose of a matrices, adjoin of a square matrix, Determinants, Properties of determinants and					
	Singular matrix.					
Week 15	Solution of system of equations by matrix inversion, Gamer's rule, Gaussian elimination.					
Week 16	Preparatory week before the final Exam					

Delivery Plan (Weekly Lab. Syllabus)					
	المنهاج الاسبوعي للمختبر				
	Material Covered				
Week 1					
Week 2					
Week 3					
Week 4					

Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس						
			Text			Available in the Library?
Required Texts• Finney, R.L, & Thomas, G.B, "Calculus" Addison. Wesley publishing company, USA,11th,2011.			Yes			
Recommended Texts	Recommended Texts• Anton, H., Bivens, I.C., Davis, S., Calculus: Early Transcendentals, Wiley, 10th edition, 2011.			Yes		
Websites         https://uomosul.edu.iq/en/engineering/environmental-engineering-dept/				ring-dept/		
			: Grading الدرجات	<b>Scheme</b> مخطط		
Group	Gr	ade	التقدير	Marks %	Definition	
	Α	- Excellent	امتياز	90 - 100	Outstanding	Performance
Success Crown	В	- Very Good	جيد جدا	80 - 89	Above avera	ge with some errors
(50 - 100)	С	- Good	ختر	70 - 79	Sound work with notable errors	
(50 100)	D	- Satisfactory	متوسط	60 - 69	Fair but with major shortcomings	
	Ε	- Sufficient	مقبول	50 - 59	Work meets minimum criteria	
Fail Group	F	<b>X –</b> Fail	راسب (قيد المعالجة)	(45-49)	More work r	equired but credit awarded
(0 – 49)	F	– Fail	راسب	(0-44)	Considerable	e amount of work required

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

### **Course Description Form**

1. Course Name:					
Engineering Drawing					
2. Course Code:					
ENGC124					
3. Semester / Year:					
2023-2024 / Fall semest	er				
4. Description Prepar	ation Date:				
1/10/2023					
5. Available Attendanc	e Forms:				
attending					
6. Number of Credit Ho	ours (Total) / Number of Units (Total)				
45 hour/ 1 unit					
7. Course administra	tor's name (mention all, if more than one name)				
Name: Aymen Wale	eed Naeif				
Email: <u>aymanwalee</u>	ed1975@uomosul.edu.iq				
Name: mohammed	husham shukur				
Email: <u>m.h.alkafaf@uomosul.edu.iq</u>					
8. Course Objectives					
Course Objectives	<ul> <li>use the technical drawing tools properly and to plot pictures according to the dimensions and properties of technical drawing</li> <li>using scale, types of scales and measurement techniques to drawings.</li> <li>Increasing the students ability to imagine</li> <li>carrying out the perspective drawings due to views.</li> </ul>				

9. Teaching and Learning Strategies							
Strategy	,	This course has several components that include lectures, classwork, homework and quiz. The course will be taught in English, and all mandatory assignments have be submitted within the deadlines to be admitted to the exams.					
10. Co	ourse S	Structure					
Week	Hours	Required Learning	Unit or subject	Learning	Evaluation		
		Outcomes	name	method	method		
11. (	Course	Evaluation	1	<u> </u>			
Distribu daily pr	iting th eparati	e score out of 100 acc on, daily oral, monthly,	ording to the tasks ass or written exams, repo	signed to the st rts etc	udent such as		
12. Learning and Teaching Resources							

Required textbooks (curricular books, if any)	Engineering Drawing & Graphic
	Technology

Main references (sources)	
Recommended books and references (scientific journals, reports)	
Electronic References, Websites	

### **Course Description Form**

1. Cou	rse Name:	
Statis	stics	
2. Cou	rse Code:	
ENV3	314	
3. Sem	ester / Year:	
First/	2023-2024	
4. Desc	cription Preparation	on Date:
1/10,	/2023	
5. Avai	lable Attendance	Forms:
In cla	ISS	
6. Num	nber of Credit Hou	urs (Total) / Number of Units (Total)
2 hou	urs per week/ tota	al units 2
7. Cou	rse administrator	s name (mention all, if more than one name)
Nam	ne: Prof. Abdulmu	hsin Sadullah Shihab
Ema	il: mss_qzz@uom	osul.edu.iq
8. Cou	rse Objectives	
Course Objec	tives	Define the procedure of data collection in a scientific way and how to describe it
		Describe probability distributions and its benefits in statistics
		Application of normal distribution in statistical tests
		Explain how to test claims
		Outline how to find the relationships between variables
9. Teac	ching and Learning	g Strategies
Strategy	Learning and teachi	ng strategies are based on a detailed presentation of the material
	with examples and	discussion in the classroom, with the student's evaluation through
	short and oral exan	ns and homework with one or more semester exams and then the
	lindi exam.	

10. Course Structure						
Week	Hours	Required Learning Outcomes	g Unit or subject name		Evaluation method	
1	2	The student will have an idea	Introduction	By attending		
2	2	about the science of statistics	Frequency distribution	class, paying	Using	
3+4	4	and able to represent the data	Central tendency and variation tools	attention,	daily	
5+6	4	and use the tools of central	Probability principles: rules and laws	discussing,	quizzes,	
7	2	Tendency and dispersion and	Application of probability laws	asking,	oral tests	
8+9	4	he can use the probability laws	Combinatorial analysis	solving	homework	
10	2	and apply normal distribution	Discrete probability distributions	homework	semester	
11-12	4	and test the hypothesis and	Normal distribution and application	and reading	and	
13-14	4	find the correlation between	Hypothesis testing	scientific	final exams	
15	2	The variables	Correlation, Chi-square test	sources		
11.Course Evaluation						
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc						

Task	Score
Quizzes	6 x 3 = 18
On site	3
Homework	3 x 5 = 15
Report	4
Semester exam	10
Final exam	50
Total	100
12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Introduction to Statistics/ Al-Rawi KH.
Main references (sources)	
Recommended books and references (scientific	

journals, reports)	
Electronic References, Websites	Statistics for Environmental Engineers 2nd Ed, CRC Press

## **Course Description Form**

13. Co	ourse Name: physics
14. Co	ourse Code: ENGE 133
15. Se	emester / Year: Spring Semester 2023-2024
16. De	escription Preparation Date: 13/2/2024
17.Available	e Attendance Forms : Attendance in person
18.Number	of Credit Hours (Total) / Number of Units (Total) (2 /week)
/(2)units	,
19. Contraction 19. Contractio 19. Contraction 19. Contraction 19. Contraction 19. Contractio	ourse administrator's name (mention all, if more than one
Name: a	yad Abdullah mousa
Email: a	yad_engineer.uomosul.edu.iq
20. Co	ourse Objectives
Course Objective	• prepare the student and equipped him with the basic knowledge to c
	with different subjects in different study levels.
	<ul> <li>utilizing Math and the basic knowledge in Physics to solve differ</li> </ul>
	problems in Engineering

21.	Teach	ing and Learning Strat	tegies		
Strategy	In lea	person lectures. The	lectures are de deliver the hom	elivered usin ework's and	g data show. handouts.
22. Course	Structu	ıre			
Week	Hours	Required Learning	Unit or subject	Learning	Evaluation
		Outcomes	name	method	method
1/2	4	Unites and measurements	The objective the Physics cou is to generate	Lectures	Quizzes Homework
3/4	4	Kinematics	fundamental knowledge skills needed the engineer		Monthly exa Final exam
5/6	4	Energy	study in various departments of engineering		
7/8/9	6	Momentum and universal gravitatio	college; that t all basic governed in way or over		
10/11/12	6	Fluid Mechanics	physics la There's no v you would so complex engineering		

13/14/15	6	Thermos dynamic	problems with understanding physics behind So the cou aimed to prep the student to advance engineering courses.		
23. Cours	se Evalı	uation			
10 marks (Qu	uizzes)				
20 mark (mo	nthly ex	am)			
5 mark (ho	me work	:)			
5 mark (prep	aration)				
60 mark (fina	al exam)				
24. Learr	ning and	Teaching Resources			
Required text	books (ci	urricular books, if any)			
Main referenc	es (sour	ces)	<ol> <li>Physics for An interact Hawkes, Ja Marina M Williams. 2</li> <li>Physics for with mode Serway an 9thedition</li> <li>Fundame Halliday, R Walker.10</li> <li>Engineerin Volume 2. and J. N. Ba</li> </ol>	r scientists and stive approach aved Iqbal, Fir ilner-Bolotin a 2 <sup>nd</sup> edition, 201 or Scientists ar ern physics. Ra d John W. Jewe , 2014.3 entals of physics obert Resnick thEdition, 2014 ng Mechanics: . J.L. Meriam, olton. 8theditio	d engineers: . Robert as Mansour, nd Peter 9. nd Engineers aymond A. ett. s. David and Jearl 1. Dynamics - L.G. Kraige on, 2015.
Recommende	d books	and references (scientific			

journals, reports)	
Electronic References, Websites	

## MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدر اسية						
Module Title	E	nvironmental Geology		Modu	le Delivery	
Module Type		Supported			🛛 Theory	
Module Code		ENV124			□ Lecture	
ECTS Credits		3			🗆 Lab	
					□Tutorial	
SWL (hr/sem)	75			⊠ Practical		
				Seminar		
Module Level		1	Semester o	f Deliver	у	2
Administering De	partment	ENV8	College	ENG4		
Module Leader	Dr. Mohamme	ed	e-mail	moham	imed1979eng@u	iomosul.edu.iq
Module Leader's	Acad. Title	Assist. Professor	Module Lea	Module Leader's Qualification Ph.D.		Ph.D.
Module Tutor			e-mail	E-mail		
Peer Reviewer Name		e-mail	E-mail			
Scientific Committee Approval Date12/06/2023Version Number1.0						

### **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 ObjectivesThis course aims to introduce the students to the cate Environmental Geology. Geology -is the study of the earth, its and their properties, its internal and external physical, chem biological properties, and its history. Environment – anything, nonliving that surrounds and influences living organisms. Envir Geology – the application of geology to environmental concerns. be achieved through descriptive lectures.						
	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.					
	<b>CLO-1:</b> The students will learn and take some information on the principles of geology, especially the materials, and compounds of the earth. (i)					
	<b>CLO-2:</b> The students will be able to distinguish the different types of rocks and soils(ii)					
Module Learning Outcomes	<b>CLO-3:</b> apply the principles of the contour line to draw topographic maps (ii)					
مخرجات التعلم للمادة الدراسية	<b>CLO-4:</b> The student who completes the course can communicate orally with others about some topics related to the relationship between environment and earth science and write some simple reports in this regard (v)					
	<b>CLO-5:</b> Report the data obtained from the selective topics of environmental geology given and organized during the course (iv)					
	<b>CLO-6:</b> Creating some opinions about the emerging environmental issues and trying to give some solutions compatible with the problems related to environmental geology (vii)					

	Indicative content includes the following.				
	Part A Introduction				
	Introduction, objectives, the general definition of environmental geology				
	Historical geology (4 hrs)				
	<u>Part B – Structural Geology</u>				
	Composition, formation of the earth's crust, types of rocks (8 hrs)				
Indicative Contents					
المحتويات الإرشادية	<u>Part C – Geology of water</u>				
	Geology of water supply, (part1) Surface Water, (part2) Ground Water				
	Geology of dams and reservoirs (8 hrs)				
	Part D – materials and maps geology				
	Geology of building materials				
	Topographical and geological maps				
	Environmental geology: special subjects (10 hrs)				

Learning and Teaching Strategies				
استراتيجيات التعلم والتعليم				
Strategies	This course has several components that include lectures, individual or group assignments, rock lab visits, and e-learning platforms. The course will be taught in Arbic and English, and all mandatory reports have to be submitted within the deadlines.			

## Student Workload (SWL)

الحمل الدر اسي للطالب محسوب لـ ١٥ اسبو عا				
Structured SWL (h/sem) الحمل الدر اسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدر اسي المنتظم للطالب أسبو عيا	2.2	
Unstructured SWL (h/sem) الحمل الدر اسي غير المنتظم للطالب خلال الفصل	42	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8	
Total SWL (h/sem) الحمل الدر اسي الكلي للطالب خلال الفصل	50			

Module Evaluation							
	تقييم المادة الدر اسية						
	Time/Number     Weight (Marks)     Week Due     Relevant Learning       Outcome						
	Quizzes	3	30 % (30)	3, 6, 9	CLO-1, CLO-1, CLO-2, CLO-4		
Formative assessment	Assignments						
	Projects / Lab.						
	Report	1	10 % (10)		All		
Summative assessment	Midterm Exam	2hr	10% (10)	7	CLO-1, CLO -2 and CLO- 3		
	Final Exam	3hr	50% (50)	16	All		
Total assessment			100% (100 Marks)				

Delivery Plan (Weekly Syllabus)				
المنهاج الاسبوعي النظري				
Material Covered				

Week 1	Introduction, objectives, general definition of environmental geology
Week 2	Historical geology
Week 3	Composition, formation of the earth's crust
Week 4	Composition, formation of the earth's crust
Week 5	Structural geology, rocks
Week 6	Structural geology, rocks
Week 7	Geology of water supply, (part1) Surface Water
Week 8	Geology of water supply, , (part2) Ground Water
Week 9	Environmental geology: special subjects
Week 10	Geology of dams and reservoirs
Week 11	Geology of dams and reservoirs
Week 12	Geology of building materials
Week 13	Topographical and geological maps
Week 14	Topographical and geological maps
Week 15	Environmental geology: special subjects
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)				
المنهاج الأسبوعي للمختبر				
	Material Covered			
Week 1				
Week 2				
Week 3				
Week 4				

Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس				
	Text	Available in the Library?		
Required Texts	Ghazi Atia Zarraq, Dr.Lafta Salman Kadhim, Dr.Mahmood Fadhil Abid, " Environmental Geology ", Iraq, 2016	No.		
Recommended Texts	Courses from internet	Yes		
Websites	https://uomosul.edu.iq/en/engineering/environmental-engine	eering-dept/		

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

نموذج وصف المادة الدر اسية

Module Information معلومات المادة الدر اسية					
Module Title	Е	Environmental Geology		Module Delivery	
Module Type		Supported		🛛 Theory	
Module Code		ENV124		□ Lecture	
ECTS Credits		3		Lab	
SWL (hr/sem)	75		□Tutorial ⊠ Practical □ Seminar		
Module Level	1		Semester o	f Delivery	2
Administering Department ENV8		College	ENG4		
Module Leader	Dr. Mohammed		e-mail	mohammed1979eng@uomosul.edu.iq	
Module Leader's Acad. Title Assist. Professor		Module Lea	ader's Qualification	Ph.D.	
Module Tutor			e-mail	E-mail	

Peer Reviewer Name		e-mail	E-mail	
Scientific Committee Approval Date	12/06/2023	Version Nu	mber	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 الدر اسية	This course aims to introduce the students to the category of Environmental Geology. Geology –is the study of the earth, its materials and their properties, its internal and external physical, chemical, and biological properties, and its history. Environment – anything, living or nonliving that surrounds and influences living organisms. Environmental Geology – the application of geology to environmental concerns. This will be achieved through descriptive lectures.					
	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.					
Module Learning Outcomes	<b>CLO-1:</b> The students will learn and take some information on the principles of geology, especially the materials, and compounds of the earth. (i)					
	<b>CLO-2:</b> The students will be able to distinguish the different types of rocks and soils(ii)					
محرجات التعلم للمادة الدراسية	<b>CLO-3:</b> apply the principles of the contour line to draw topographic maps (ii)					
	<b>CLO-4:</b> The student who completes the course can communicate orally with others about some topics related to the relationship between					

	environment and earth science and write some simple reports in this regard (v)
	<b>CLO-5:</b> Report the data obtained from the selective topics of
	and trying to give some solutions compatible with the problems related to environmental geology (vii)
	Indicative content includes the following.
	Part A Introduction
	Introduction, objectives, the general definition of environmental geology
	Historical geology (4 hrs)
	<u>Part B – Structural Geology</u>
	Composition, formation of the earth's crust, types of rocks (8 hrs)
Indicative Contents	
المحتويات الإرشادية	<u>Part C – Geology of water</u>
	Geology of water supply, (part1) Surface Water, (part2) Ground Water
	Geology of dams and reservoirs (8 hrs)
	Part D – materials and maps geology
	Geology of building materials
	Topographical and geological maps
	Environmental geology: special subjects (10 hrs)

	Learning and Teaching Strategies
	استراتيجيات التعلم والتعليم
Strategies	This course has several components that include lectures, individual or

group assignments, rock lab visits, and e-learning platforms. The course
will be taught in Arbic and English, and all mandatory reports have to be
submitted within the deadlines.

Student Workload (SWL) الحمل الدر اسي للطالب محسوب لـ ١٥ اسبو عا			
Structured SWL (h/sem) الحمل الدر اسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبو عيا	2.2
Unstructured SWL (h/sem) الحمل الدر اسي غير المنتظم للطالب خلال الفصل	42	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
Total SWL (h/sem) الحمل الدر اسي الكلي للطالب خلال الفصل		50	

Module Evaluation						
	تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome	
	Quizzes	3	30 % (30)	3, 6, 9	CLO-1, CLO-1, CLO-2, CLO-4	
Formative assessment	Assignments					
	Projects / Lab.					
	Report	1	10 % (10)		All	
Summative assessment	Midterm Exam	2hr	10% (10)	7	CLO-1, CLO -2 and CLO- 3	
	Final Exam	3hr	50% (50)	16	All	
Total assessment		100% (100 Marks)				

	Delivery Plan (Weekly Syllabus)			
المنهاج الاسبوعي النظري				
	Material Covered			
Week 1	Introduction, objectives, general definition of environmental geology			
Week 2	Historical geology			
Week 3	Composition, formation of the earth's crust			
Week 4	Composition, formation of the earth's crust			
Week 5	Structural geology, rocks			
Week 6	Structural geology, rocks			
Week 7	Geology of water supply, (part1) Surface Water			
Week 8	Geology of water supply, , (part2) Ground Water			
Week 9	Environmental geology: special subjects			
Week 10	Geology of dams and reservoirs			
Week 11	Geology of dams and reservoirs			
Week 12	Geology of building materials			
Week 13	Topographical and geological maps			
Week 14	Topographical and geological maps			
Week 15	Environmental geology: special subjects			
Week 16	Preparatory week before the final Exam			

	Delivery Plan (Weekly Lab. Syllabus)
	المنهاج الأسبوعي للمختبر
	Material Covered
Week 1	

Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس					
	Text	Available in the Library?			
Required Texts	Ghazi Atia Zarraq, Dr.Lafta Salman Kadhim, Dr.Mahmood Fadhil Abid, " Environmental Geology ", Iraq, 2016	No.			
Recommended Texts	Courses from internet	Yes			
Websites	https://uomosul.edu.iq/en/engineering/environmental-engine	eering-dept/			

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

(0 – 49)	<b>F</b> – Fail	راسب	(0-44)	A considerable amount of work required

### MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information معلومات المادة الدر اسية					
Module Title		Calculus		Module Delivery	
Module Type	Suppor	t or related learning act	ivity	🛛 Theory	
Module Code		ENV121		Lecture	
ECTS Credits		6		🗆 Lab	
				🛛 Tutorial	
SWL (hr/sem)		150	150		
				🗆 Seminar	
Module Level		1	Semester o	f Delivery	2
Administering Department ENV8		College	ENG4		
Module Leader	Mayada Hazim		e-mail	mayada.hmah@uomosu	ul.edu.iq

Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		alification	M.Sc.
Module Tutor	Abeer Khalil II Aya Thamer Ib	Abeer Khalil Ibrahim Aya Thamer Ibrahim		<u>abeer.alsaraf@uomosul.edu.iq</u> aya.thamer <u>@uomosul.edu.iq</u>		<u>.edu.iq</u> :du.iq
Peer Reviewer Name		Mayada Hazim	e-mail	mayada.hmah@uomosul.edu.iq		ıl.edu.iq
Scientific Committee Approval Date		19/2/2023	Version Number		2.0	

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

Modu	Module Aims, Learning Outcomes and Indicative Contents				
	أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية				
Module Objectives	The aim of this course is to introduce the students to the main topics of Calculus The course will cover Integration, Applications of Definite Integrals, The Calculus of Transcendental Function, Techniques of Integration and Polar Coordinates.				
أهداف المادة الدر اسية	At the end of the course, students will have a broad knowledge of the basic concepts of integration, techniques of integration, applications of definite integrals, and Polar coordinates. This will be achieved through theoretical lectures, tutorials and homework				
Module Learning Outcomes	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.				

مخرجات التعلم للمادة الدراسية	<b>CLO-1:</b> Recognize indefinite integrals and definite integral and know the basic properties(i).
,	<b>CLO-2:</b> Use applications of definite integral to find areas between curves, volumes, lengths of plane curves and areas of surfaces of revolution(ii).
	<b>CLO-3:</b> Identified and understand of transcendental functions and know the basic properties(i).
	<b>CLO-4:</b> Applied techniques of integration to change unfamiliar integrals into integrals we can recognize and solve(i).
	<b>CLO-5:</b> Identified and understand of Polar Coordinates and know the basic properties(i).
	Indicative content includes the following.
	Part A – Integration
	Calculus and Area, Formulas for Finite sums, Definite Integrals, The Fundamental Theorems of Integral Calculus, Indefinite Integrals, Integration by Substitution –Running the Chain Rule Backward(10 hrs).
	Part B – Applications of Definite Integrals
Indicative Contents	Areas between Curves, Calculus and Area, Volumes of Solids of Revolution-Disks and Washers, Cylindrical Shells-An Alternative to Washers, Lengths of Curves in the Plane, Areas of Surfaces of Revolution(15 hrs).
المحتويات الإرشادية	Part C –The Calculus of Transcendental Function
	Inverse Function and Their Derivatives, Ln x ,e <sup>x</sup> , and Logarithmic Differentiation, Indeterminate Forms and Hospital's Rule, Other Exponential and Logarithmic Function, The Inverse Trigonometric Function, Derivatives of Inverse Trigonometric Functions(15 hrs).
	Part D - Techniques of Integration
	Basic Integration Formulas, Integration by Parts, Trigonometric Integrals, Trigonometric Substitutions, Rational Functions and Partial Fractions, Using Integral Tables. Improper Integrals. (20 hrs).

	Part E - Plane Curves and Polar Coordinates Polar Coordinates: Definition of Polar Coordinates, Negative Values of r, Changing to Radian Measure, The Use of Radian Measure, Elementary Coordinate Equations and Inequalities, Cartesian Versus Polar Coordinates, Graphing in Polar Coordinates: Symmetry and Slope, Faster Graphing, Finding the Points Where Curves Intersect. (15 hrs).				
	Learni	ng and Tea	ching Strategies		
		، التعلم والتعليم	استراتيجيات		
Strategies الاستر اتيجيات	Expanding students' perceptions of Calculus, familiarity with basic Calculus concepts and principles, and the ability to distinguish between different mathematical concepts. This course has several components that include studying lectures, tutorial, discussion, homework, and e-learning platforms. The course will be taught in English, and all compulsory assignments have to be submitted within the deadlines to be admitted to the exam.				
Student Workload (SWL)					
	ا اسبوعا	ں محسوب لـ <sup>ہ</sup>	الحمل الدراسي للطالب		
Structured SWL (h/sem) الحمل الدر اسي المنتظم للطالب خلال الفصل		80	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.3	
Unstructured SWL (h/sem) الحمل الدر اسي غير المنتظم للطالب خلال الفصل		70	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7	
Total SWL (h/sem) الحمل الدر اسي الكلي للطالب خلال الفصل			175		

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

Formative assessment	Quizzes	5	5% (25)	3, 5, ,8,11 and 14	CLO-1, CLO-2, CLO-3, CLO-4, CLO-5
	Online Assignments	1	3% (3)	6	CLO-1, CLO-2.
	Onsite Assignment	4	2% (8)	3, 6, 9, 12	CLO-1, CLO-2, CLO-3, CLO-4, CLO-5.
	Projects / Lab.	0	0	0	
	Report	1	4% (4)	12	CLO-1, CLO-2, CLO-3, CLO-4.
Summative	Midterm Exam	2hrs	10% (10)	9	CLO-1, CLO -2, CLO -3,
assessment	Final Exam	3hrs	50% (50)	16	All
Total assessment		100% (100 Marks)			

	Delivery Plan (Weekly Syllabus)				
	المنهاج الأسبوعي النظري				
	Material Covered				
Week 1	Calculus and Area, Formulas for Finite sums, Definite Integrals, The Fundamental Theorems of Integral Calculus, Indefinite Integrals,				
Week 2	Integration by Substitution – Running the Chain Rule Backward.				
Week 3	Areas between Curves, Calculus and Area.				
Week 4	Volumes of Solids of Revolution-Disks and Washers, Cylindrical Shells-An Alternative to Washers.				
Week 5	Lengths of Curves in the Plane, Areas of Surfaces of Revolution				
Week 6	Inverse Function and Their Derivatives, Ln x , $e^x$ , and Logarithmic Differentiation				
Week 7	Indeterminate Forms and Hospital's Rule, Other Exponential and Logarithmic Function.				
Week 8	The Inverse Trigonometric Function, Derivatives of Inverse Trigonometric Functions.				
Week 9	Basic Integration Formulas, Integration by Parts.				
Week 10	Trigonometric Integrals, Trigonometric Substitutions.				

Week 11	Rational Functions and Partial Fractions.
Week 12	Using Integral Tables. Improper Integrals.
Week 13	Polar Coordinates: Definition of Polar Coordinates, Negative Values of r, Changing to Radian Measure, The Use of Radian Measure.
Week 14	Elementary Coordinate Equations and Inequalities, Cartesian Versus Polar Coordinates,
Week 15	Graphing in Polar Coordinates: Symmetry and Slope, Faster Graphing, Finding the Points Where Curves Intersect.
Week 16	Preparatory week before the final Exam

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

Learning and Teaching Resources					
	مصادر التعلم والتدريس				
	Text	Available in the Library?			
Required Texts	• Finney, R.L, & Thomas, G.B, "Calculus" Addison. Wesley publishing company, USA,11th,2011.	Yes			
Recommended	• Anton, H., Bivens, I.C., Davis, S., Calculus: Early	Yes			

Texts	Transcend	Transcendentals, Wiley, 10th edition, 2011.				
Websites	https://uomos	ental-engineering-dept/				
		Grading S	Scheme			
		الدرجات	مخطط			
Group	Grade	التقدير	Marks %	Definition		
	A - Excellent	امتياز	90 - 100	Outstanding Performance		
Success Group	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors		
(50 - 100)	<b>C</b> - Good	ختر	70 - 79	Sound work with notable errors		
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings		
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria		
Fail Group	<b>FX –</b> Fail	ر اسب (قيد المعالجة)	(45-49)	More work required but credit awarded		
(0 – 49)	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required		

## MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدر اسية				
Module Title	Calculus	Module Delivery		
Module Type	Support or related learning activity	🖾 Theory		
Module Code	ENV121	□ Lecture		
ECTS Credits	6	🗆 Lab		
SMU (br/com)	150	🛛 Tutorial		
SVVL (III/Sem)	150	Practical		

					Seminar	
Module Level		1	Semester of Delivery		2	
Administering De	partment	ENV8	College	College ENG4		
Module Leader	Mayada Hazim	1	e-mail	<u>mayada</u>	hmah@uomosu	<u>ıl.edu.iq</u>
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification M.S		M.Sc.	
Module Tutor	Abeer Khalil Ibrahim Aya Thamer Ibrahim		e-mail	<u>abeer.a</u> aya.tha	<u>lsaraf@uomosul</u> mer <u>@uomosul.e</u>	<u>.edu.iq</u> du.iq
Peer Reviewer Name		Mayada Hazim	e-mail	mayada.hmah@uomosul.edu.iq		ıl.edu.iq
Scientific Committee Approval Date		19/2/2023	Version Nu	mber	2.0	

Relation with other Modules				
العلاقة مع المواد الدر اسية 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 الدر اسية	The aim of this course is to introduce the students to the main topics of Calculus The course will cover Integration, Applications of Definite Integrals, The Calculus of Transcendental Function, Techniques of Integration and Polar Coordinates.				
	At the end of the course, students will have a broad knowledge of the basic concepts of integration, techniques of integration, applications of definite integrals, and Polar coordinates. This will be achieved through theoretical				

	lectures, tutorials and homework
	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.
	<b>CLO-1:</b> Recognize indefinite integrals and definite integral and know the basic properties(i).
Module Learning Outcomes	<b>CLO-2:</b> Use applications of definite integral to find areas between curves, volumes, lengths of plane curves and areas of surfaces of revolution(ii).
	<b>CLO-3:</b> Identified and understand of transcendental functions and know the basic properties(i).
مخرجات التعلم للمادة الدراسية	<b>CLO-4:</b> Applied techniques of integration to change unfamiliar integrals into integrals we can recognize and solve(i).
	<b>CLO-5:</b> Identified and understand of Polar Coordinates and know the basic properties(i).
	Indicative content includes the following.
	Part A – Integration
	Calculus and Area, Formulas for Finite sums, Definite Integrals, The Fundamental Theorems of Integral Calculus, Indefinite Integrals, Integration by Substitution –Running the Chain Rule Backward(10 hrs).
	Part B – Applications of Definite Integrals
Indicative Contents المحتويات الإرشادية	Areas between Curves, Calculus and Area, Volumes of Solids of Revolution-Disks and Washers, Cylindrical Shells-An Alternative to Washers, Lengths of Curves in the Plane, Areas of Surfaces of Revolution(15 hrs).
	Part C – The Calculus of Transcendental Function
	Inverse Function and Their Derivatives, Ln x ,e <sup>x</sup> , and Logarithmic Differentiation, Indeterminate Forms and Hospital's Rule, Other Exponential and Logarithmic Function, The Inverse Trigonometric Function, Derivatives of Inverse Trigonometric Functions(15 hrs).
	Part D - Techniques of Integration

	Basic Integra Trigonometric Using Integral <u>Part E - Plane</u> Polar Coordin Changing to R	tion Formula Substitutio Tables. Imp <u>Curves and F</u> ates: Definiti	as, Integration by Parts, Trigonometric ons, Rational Functions and Partial roper Integrals. (20 hrs). <u>Polar Coordinates</u> ion of Polar Coordinates, Negative Value ure, The Use of Radian Measure, Elemer	Integrals, Fractions, es of r, htary
	Coordinates, Graphing, Find	Graphing in I ding the Poir	Polar Coordinates: Symmetry and Slope nts Where Curves Intersect. (15 hrs).	, Faster
	Learni	ng and Tea	ching Strategies	
		، التعلم والتعليم	استراتيجيات	
Strategies الاستر اتيجيات	Expanding students' perceptions of Calculus, familiarity with basic Calculus concepts and principles, and the ability to distinguish between different mathematical concepts. This course has several components that include studying lectures, tutorial, discussion, homework, and e-learning platforms. The course will be taught in English, and all compulsory assignments have to be submitted within the deadlines to be admitted to the exam.			
	Ste	udent Worl	kload (SWL)	
	ا اسبوعا	ں محسوب لے <sup>0</sup>	الحمل الدراسي للطالب	
Structured SWL (h/sem) الحمل الدر اسي المنتظم للطالب خلال الفصل		80	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		70	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدر اسي الكلي للطالب خلال الفصل			150	

#### **Module Evaluation**

تقييم المادة الدراسية						
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome	
	Quizzes	5	5% (25)	3, 5, ,8,11 and 14	CLO-1, CLO-2, CLO-3, CLO-4, CLO-5	
Formative assessment	Online Assignments	1	3% (3)	6	CLO-1, CLO-2.	
	Onsite Assignment	4	2% (8)	3, 6, 9, 12 and 15	CLO-1, CLO-2, CLO-3, CLO-4, CLO-5.	
	Projects / Lab.	0	0	0		
	Report	1	4% (4)	12	CLO-1, CLO-2, CLO-3, CLO-4.	
Summative	Midterm Exam	2hrs	10% (10)	9	CLO-1, CLO -2, CLO -3,	
assessment	Final Exam	3hrs	50% (50)	16	All	
Total assessment			100% (100 Marks)			

Delivery Plan (Weekly Syllabus)					
	المنهاج الاسبوعي النظري				
	Material Covered				
Week 1	Calculus and Area, Formulas for Finite sums, Definite Integrals, The Fundamental Theorems of Integral Calculus, Indefinite Integrals,				
Week 2	Integration by Substitution – Running the Chain Rule Backward.				
Week 3	Areas between Curves, Calculus and Area.				
Week 4	Volumes of Solids of Revolution-Disks and Washers, Cylindrical Shells-An Alternative to Washers.				
Week 5	Lengths of Curves in the Plane, Areas of Surfaces of Revolution				
Week 6	Inverse Function and Their Derivatives, $Ln \times e^{x}$ , and Logarithmic Differentiation				
Week 7	Indeterminate Forms and Hospital's Rule, Other Exponential and Logarithmic Function.				

Week 8	The Inverse Trigonometric Function, Derivatives of Inverse Trigonometric Functions.
Week 9	Basic Integration Formulas, Integration by Parts.
Week 10	Trigonometric Integrals, Trigonometric Substitutions.
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Week 12	Using Integral Tables. Improper Integrals.
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Week 14	Elementary Coordinate Equations and Inequalities, Cartesian Versus Polar Coordinates,
Week 15	Graphing in Polar Coordinates: Symmetry and Slope, Faster Graphing, Finding the Points Where Curves Intersect.
Week 16	Preparatory week before the final Exam

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

Learning and Teaching Resources	
مصادر التعلم والتدريس	
Text	Available in the Library?

Required Texts	<ul> <li>Finney, R. publishing</li> </ul>	L, & Thomas, G.B, "C company, USA,11th,2(	alculus" Add 011.	ison. Wesley	Yes		
Recommended Texts	Anton, H     Transcend	l., Bivens, I.C., Dav entals, Wiley, 10th edit	vis, S., Cal tion, 2011.	culus: Early	Yes		
Websites	https://uomos	https://uomosul.edu.iq/en/engineering/environmental-engineering-dept/					
		Srading S الدرجات	Scheme مخطط				
Group	Grade	التقدير	Marks %	Definition			
	A - Excellent	امتياز	90 - 100	Outstanding	Performance		
Success Group	<b>B</b> - Very Good	جيد جدا	80 - 89	Above avera	ge with some errors		
(50 - 100)	<b>C</b> - Good	ختر	70 - 79	Sound work	with notable errors		
(30 - 100)	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with	major shortcomings		
	E - Sufficient	مقبول	50 - 59	Work meets	minimum criteria		
Fail Group	<b>FX</b> — Fail	راسب (قيد المعالجة)	(45-49)	More work r	equired but credit awarded		
(0 – 49)	<b>F</b> — Fail	راسب	(0-44)	Considerable	e amount of work required		

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

		Mo ىىية	dule i الدراء	Informatio معلومات المادة	n N	
Module Title	رارة	مودايناميك وانتقال الح	ثر،		Module Delivery	
Module Type		دأعم			• 🛛 Theory	
Module Code		ENV114			<ul> <li>■ Lecture</li> <li>■ Lab</li> </ul>	
ECTS Credits		4			• 🛛 Tutorial	
SWL (hr/sem)		100			•	
Module Level	-	1		Semester of	Delivery	1

Administering Department		nt	ENV8	College	ENG4				
Module Leader	Maan S	5. Mo	hammed	e-mail	maandabbagh@uomosul.edu.iq			ı.iq	
Module Leader's	Acad. Ti	tle	Ass. Professor	Module L	eader's Q	uali	fication	M.Sc	
Module Tutor	Maan	S. Mo	ohammed	e-mail	maanda	abba	gh@uomo	osul.edu	ı.iq
Peer Reviewer Na	me		Maan S.Mohammed	e-mail	maanda	abba	gh@uomo	osul.edu	ı.iq
Scientific Commit Approval Date	tee		07/11/2023	Version N	umber	1.0			
	Relation with دراسية الأخرى	n other N مع المواد الا	lodules العلاقة م	;					
Prerequisite modu	ule	N/A	4				Semeste	r	
Co-requisites module N/A			A				Semeste	r	
	Modu	le A ادية	ims, Learning Out تعلم والمحتويات الإرشا	comes ar ية ونتائج ال	nd Indic دة الدراس	ativ الما	ve Conte أهداف	ents	
ن التعلم بوضوح أهداف هذا الموضوع المتكامل. 2- تمكين الطالب من معرفة المفاهيم النظرية والعملية للعمليات الديناميكية الحرارية. 3- تمكين الطالب من معرفة المفاهيم النظرية والعملية لخصائص المواد الفيزيائية وتأثير الحرارة عليها. 4- تمكين الطالب من معرفة أنواع الطاقة وتطبيقاتها. 5- تمكين الطالب من معرفة أنواع الطاقة وتطبيقاتها. 6- تطوير المبادئ والقوانين الأساسية للثرمودايناميك واستكشاف آثار هذه المبادئ على سلوك النظام المعادة العراسية العامليات الذياميكية الحرارة على المواد الفيزيائية وتأثير الحرارة العدام المواد الفيزيائية وتأثير الحرارة العالم من قياس درجة الحرارة والضغط بأجهزة القياس التقليدية والحديثة. 7- تمكين الطالب من معرفة أنواع الطاقة وتطبيقاتها. 7- صياغة النماذج اللازمة للدراسة. 8- تمكين الطالب من التعرف على أنواع الأنظمة وتطبيقاتها وكيفية التعامل معها. 9- القدرة على التعامل مع المفاهيم رياضياً، والفهم الوظيفي لكيفية تنفيذ هذه الأفكار في العالم العادة العراسية. 10- تحليل وتصميم أنظمة نقل الحرارة من خلال تطبيق هذه المبادئ. 11- استخدم الرسوم البيانية لورسوم النتائج. 12- تطوير مهارات حل المشكلات الأساسية للممارسة الهندسية الجيدة لنقل الحرارة في تطبيقات. 13- تطيور مهارات حل المشكلات الأساسية للممارسة الهندسية الجيدة لنقل الحرارة في تطبيقات. 14- تطوير مهارات حل المشكلات الأساسية للممارسة الهندسية الجيدة لنقل الحرارة في تطبيقات.					-1 -2 -3 -4 -5 -6 -7 -8 -9 -10 -11 -12				
Module Learnin Outcomes خرجات التعلم للمادة الدر اسية	اسة لمة برية سية من من بيئة عية الزة لوم بات سبة سبة سية	ع الدر ع الأنف ة والض ا الحرا ل إلى كار العا الصالب ن الميزي ن الميز ل الحر ل الحر ل المين و لعامنا م المنا	التي يجب وصعها. نعل أن تكون مساوية لعدد أسابير عمل المفاهيم والتعاريف وأنوا اسة المفاهيم الأساسية للديناميك لأوصاف الفيزيائية إلى معادلاد يمكن استخدامها لضمان التوص طوير قدرتهم على إيصال الأفكر إستفادة من المصادر، وتمكين ا لاستفادة من المصادر، وتمكين ا ية انتقال الحرارة على الأنظمة أنواع الطاقة والمؤسسات ماذج الرياضية للأنظمة الفيزياة ماذج الرياضية للأنظمة الفيزياة در ولما وقاً لمبادئ الهندس يدة واستخدام استر اتيجيات التعا مشاريع مختلفة للعمل ضمن فر	ا والاسر، صاب بمية، ومن الأفط بدف رقم 3: در اسة ب لدف رقم 3: در للات وترجمة ا الأخرى التي ب للي الإنترنت للا لي الإنترنت للا رية وإعداد كتي العمان العمل ف رحة، وشرح الذ يو أخلاقي في ي وأخلاقي في	مم استحدامه خرجات تعلم الهدف رارة ومعرف بي حل المشك أو الكميات نية محددة لا بناميكا الحرا نياميكا الحرا مغلقة والمفقو شكلات الهند شكل احتراف	لي سير جة الح بيدة علم توسط أم براد فهم وزرقم لمة الد لمة الد لم اكتر	سر البجيات ال تتب على الأقل ق مرنة و إبداع م النتائج الم يفهمونه وطر ليومية الخاص بد من استخدا يومية الخاص يومية الخاص يومية الخاص يومية الخاص يومية الخاص يومية الحاص يومية المية الحاص يومية المية المية المية الممة المية المومة المي يومية المية المومة المي يومية المية الموم	افر رادس عناك علوير قدر قم 5: فحم عديد ما لا كين الطلا كين الطلا التقارير ال الم قدرة على قدرة على	ــــــــــــــــــــــــــــــــــــ

	التخصصات.			
	حتوى الإر شادي ما يلي	يتضمن الم		
	<b>.</b>		ساسية، ويشمل: [10 ساعات]	الكميات الأ
		صحيح	م الدولي للوحدات وكتتبة الوحدات ومختصر اتها بشكل ا	- النظا
		C.	قدرة الطالب على فهم الأجسام الديناميكية الحرارية.	- تنمية
			ف على أنواع الطاقة وتطبيقاتها.	- التعري
			ة الفرق بين انتقال الحر ار ة و الشغل.	۔ معرف
		بق النظام	بمكن حساب الحرارة المفقودة والمكتسبة من أو عن طر	۔ کیف
			يمكن حساب الطاقة من أو عن طريق النظام.	۔ کیف
			انتقال الحرارة في النظام المغلق	- تمىيز
			العمل في النظام المغلق.	- تميز
			لة وتطبيقاتها: [10 ساعات]	النواع الطاة
			شرح وتطبيق الفرق بين ضغط المقياس	۔ ذکر و
			ق بين الضغط للمواد الصلية والسائلة والغازية.	- التفري
			ب بین بمکن حساب و نقل الو حدات	۔ کیف
Indicative			المشاکل . لمشاکل	- حلّ ا
Contents			المثالي [10 ساعات]	ی قانون الغاز
المحتويات الإرشادية			الغاز المثالي (الغاز المثالي)	۔ ما هو
			ية قانون الغاز العام	_ دراس
		نون حاي لو ساك	ب العديد من ثابت الغاز، وقانون يويل وقانون تشار لز، وقا	_ سلوك
		. , , , , , ,		far ante a
		ب مربع رو	ل للديناميكا الحرارية وتطبيقاته: [10 ساعات]	القانون الاو
	ري معرفة الفرق بين	<sup>2</sup> بدقة من الضرو	اجل التعامل مع موضوع الديناميكا الحرارية التطبيقيا تدر	- من
			فات. بنا بن ا	التطبير
			سائل العمل. تربيب بانتر من	- حاله
			له معادله عدم الندفق.	- دراس
			ـه معادله الندفق التابت.	- دراس
			ل بين النظام المغلق والنظام المعنوح ونطبيفهما	- الفرو
			ارة: [5 ساعات]	<ul> <li>انتقال الحر</li> </ul>
			) الحرارة بالتوصيل.	– انتقار استعار
			) الحرارة بالحمل الحراري. الاسترارة بالحمل الحراري.	– انتقار است
		–	) الحرارة بالإشعاع.	– انتفار
	Learn	تعلم و التعليم	eaching Strategies است اتتحیات الذ	
	مادين مع تحسين	المشاركة في الذ	الأساسية اتقديم هذه المحدة هي تشجيع الطلاب على	ستكمن الاستر اتبحية
Strategies	التعليمية التفاعلية	لدر اسية والبر امج	س النقدي لديهم. وسيتم تحقيق ذلك من خلال الفصول ا	وتوسيع مهار ات التفك
الاستراتيجيات	لب مثيرة للاهتمام	، التي يجدها الطلا	لر في التجارب البسيطة التي تتضمن أنشطة أخذ العينات	والنظ
	SI	tudent Wo	orkload (SWL)	
		ي للطالب	الحمل الدراس	
Structured SWL (h/se المنتظم للطالب خلال الفصل	m) الحمل الدر اسي	48	Structured SWL (h/w) الحمل الدر اسى المنتظم للطالب أسبو عيا	3.2
Unstructured SWL (h	/sem)		Unstructured SWL (h/w)	a -
المنتظم للطالب خلال الفصل	الحمل الدراسي غير	52	الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
Total SWL (h/sem) الكلي للطالب خلال الفصل	الحمل الدر اس		100	
ي السي ــــــــــــــــــــــــــــــــــــ				
		Module	Evaluation	
		الدراسية	تقييم المادة	

		Ті	me/Number	W( (M	eight arks)	Weel	k Due	Rele	evant Learning Outcome
	Quizzes	5	5	4%	6 (20)	4,6,9 and	9,11, 15	Ŀ	1,2,10,11, and 12 الاهداء
Formative	Assignn	nents	4	29	% (8)	5,7,1	.0,12		1,2,11, and 12 الأهداف
assessment	On-site Assignn	nents	2	29	% (4)	3	,8		10, and 12 الأهداف
	Reports	5	2	49	% (8)	5, ar	nd 13	ن ت	1,2,10,11, and 12 الأهداه
Summative	Midteri Exam	m	2hrs	10%	% (10)	-	7	هداف	1,2,3,4,5,6,7,8,9,10,11, and 12
assessment	Final Ex	am	3hrs	50%	% (50)	1	6		جميع الاهداف
Total assessn	nent			1009 M	% (100 arks)				
			Delivery	Dan (	Mookly	Sylla	huc)		
			Denvery			sist	busj		
			–ري	. حي ، ــــ		,			
	بواد والوحدة	المقدمة مالأ			viaterial C	.overe	a		
Week 1	بعد والوكدة واع الأنظمة	والتعاريف وأذ	بعض المفاهيم						
Week 2	<u></u> جة الحرارة	<u>ں</u> الضغط ودر	قياه						
Week 3	الغاز المثالية	قوانين							
Week 4	ورقة المسائل المحلولة رقم 1 الواجب المنزلي 1 اختبار								
Week 5	شكال الطاقة		- , -	-					
Week 6	اختبار	ب المنزلي 2	لةرقم 2 الواج	لل المحلو	ورقة المسائ				
Week 7	صف الفصل	امتحان ند							
Week 8	يكا الحرارية لنظام المغلق	ل الأول للدينام ل على عملية ا	الحرارية / القانور بة الحرارية - تطبق	الديناميكا الديناميكي	قو انين العمليات				
Week 9	اختبار	بب المنزلي 3	رلة رقم 3 الوام	ائل المحلو	ورقة المس				
Week 10	نظام المفتوح	على عملية الن	الحرارية - مطبقة	ديناميكية	العمليات ال				
Week 11	۷ اختبا <u>ر</u>	جب المنزلي 4	لولة رقم 4 الوا	بائل المحا	ورقة المس				
Week 12	نقال الحرارة انتابالا	طرق انا اترابية باليؤ با	1						
Week 13	ليفن الحرارة امرة الحرارة	لنطبيق البيني ا		11					
Week 14	ويہ الحرارہ 5 اختداد	رة وغير مس	<u>يات مساويد الحرم</u> الواحد، الم	رقہ 5	المحاملة	قة اأمسا	<u>، م</u>		
Week 16	ی ر <u>بر</u> بیل الدر اسی	<u>ري</u> ان النمائي للف <u>ح</u>	<u>عربب مح</u> الامتد	5-7			))		
		<u>ن</u> بي	Learning a	nd Te	aching	Reso	IIICAS		
				ه التدرية	ادر التعلم	مص	urces		
				Te	<u>, , , , , , , , , , , , , , , , , , , </u>				Available in the Library?
Required Te	xts	Applied t	hermodynami /	cs fifth	edition b	y t.d e	astop a	and a.	Yes
Recommended Y. A. Çengel and				. A. E	Boles, Th	ermod	ynamic	s: An	No
Texts		Engineeri	ng Approach, S	5th ed,	McGraw-	Hill, 20	06		INU
Websites	Websites <u>https://uomosul</u>				gineering,	/enviro	nmenta	al-engin	<u>eering-dept/</u>
			Grading	Sche	me مخطط الد				
Group	Grade		التقدير		Marks	D	efinitio	n	
Success	<b>A</b> - Ex	cellent	امتياز		( <i>7</i> ) 90 - 100	هل	أداء مذر		

Group				
(50 - 100)	<b>B</b> - Very Good	جيد جدا	80 - 89	فوق المتوسط مع بعض الأخطاء.
	<b>C</b> - Good	خت	70 - 79	عمل سليم مع وجود أخطاء ملحوظة.
	<b>D -</b> Satisfactory	متوسط	60 - 69	متوسط ولكن مع عيوب كبيرة
	E - Sufficient	مقبول	50 - 59	العمل يلبي الحد الأدنى من المعابير.
Fail Group	<b>FX –</b> Fail	راسب (قيد المعالجة)	(45-49)	مطلوب المزيد من العمل، ولكن يتم منح الانتمان.
(0 – 49)	<b>F</b> — Fail	راسب	(0-44)	مطلوب قدر كبير من العمل
تقريب علامة 54.5	(على سبيل المثال، سيتم	بة الكاملة الأعلى أو الأدني	ن 0.5 إلى العلام	ملاحظة: سيتم تقريب العلامات العشرية التي تزيد أو تقل ع

إلى 55، في حين سيتم تقريب علامة 54.4 إلى 54. لدى الجامعة سياسة عدم التغاضي عن "فشل التُمريرة الُقريبة" وبالتألي فإن التعديل الوحيد للعلامات الممنوحة بواسطة العلامة (العلامات) الأصلية سيكون التقريب التلقائي الموضح أعلاه.

### **Course Description Form**

1. Course Name:	
2. Course Code:	<u>W242</u>
3 Semester / Year:	V 242
Autum	n Semester/2023-2024
4. Description Preparation Date:	
	2023-2024
5. Available Attendance Forms:	· · · ·
Incide t	the class, online
6. Number of Credit Hours (Total) / N	umber of Omits (Total)
	2/2
7. Course administrator's name (m	ention all, if more than one name)
Name: Hanan Haqi Thura Azz	am
Email: <u>hanan.eng2014@uomosul</u>	<u>.edu.iq</u>
<u>111ura.azzam@uomosur.eut</u>	<u>1.10</u>
8. Course Objectives	
Course Objectives	• During this course, the student
	learns about the tasks of an
	environmental engineer, as well as
	distinguishing between the most
	common types of pollution in the
	surrounding environment.
	•Study the quality of water and solid
	waste.
	• Briefly study drinking water
	units and wastewater treatment
	plants.
	• Identify noise, air, thermal and radiation pollution, which will be expanded upon in the stages of the study.

9. Tea	ching ar	nd Learning	g Strategies			
		Strategy	The strategy is achie learning platforms, class assignments.	eved throug and giving	h lectures, g home a	e- nd
10. Cours	e Struct	ure				
Week	Hours	Required I	Learning Outcomes	Unit or subject name	Learning method	Evalua tion metho d
2	4	Get a gen the conce environm and learn	eral idea about pt of nental engineering about Physical	Introducti on. What's the	PowerPo t lecture	Daily exam
1	2	and chem propertic	nical es of water.	environm ental engineeri ng Duties	PowerPo t lecture	Daily exam a
1	2	surface w and their requ	vater pollutants	of Environm ental	t lecture PowerPo	rk Homew
2	4	oxygen.		Engineer. water: chemical	t lecture PowerPo	rk
2	4	Applying balance to common	the principle of mass o some environmental	and physical properties of water.	int lecture	Daily exam
1	2	Knowledg	ge of the phenomeno at enrichment in	Definition for solids found in	PowerP oint lecture	Daily exam
2	4	lakes and thermal s	the phenomenon of tratification.	water & wastewate	PowerPo	Daily
2	4	Determin	e the units of both	r. Classifica tion of	t lecture	and Homew
1	2	plants an Waste wa	d treatment plants iter.	size range of particles	lecture	Class assign
1	2	Knowledg character	ge of the sources a ristics of solid	tound in water. Water	lecture discussio	ment a repor

waste.	quality.	
Identify noise pollution	Surface	
harms and ways to combat it	nollution	a repor
haims, and ways to combat it.	and its	
Identify the most common typ	sources,	a repor
of pollution in the environme	The EPA	•
such as air pollution.	Beneficial	
	Uses of	
Knowledge of thermal pollution	Water	
its sources, and ways to redu	Biochemi	
its impact on waterbodies.	cal	
Identify radioact	Oxygen	
contamination and ways	Demand.	
	Mass	
	Balance	
	Approach	
	To Solve	
	Environm	
	ental	
	Problems	
	steady –	
	State	
	condition	
	Conservat	
	ive.	
	Water	
	quality in	
	lakes.	
	characteri	
	stics	
	,Factors	
	Controllin	
	g The	

	Eutrophic	
	ation	
	,Thermal	
	Stratificat	
	ion	
	.Stratificat	
	ion and	
	Dissolved	
	Oxvgen.	
	Water	
	treatment	
	Water	
	requireme	
	nt: Water	
	consumpti	
	on	
	(compone	
	nts):	
	Water	
	treatment	
	plant.	
	wastewate	
	r	
	treatment	
	plant	
	.,character	
	istics of	
	wastewate	
	r.	
	pretreatm	
	ent units –	
	primary	
	treatment	
	units .	
	secondary	
	treatment	
	Solid	
	Waste.	
	Sources	
	and	
	characteri	

stics of
Solid
Waste
Solid
Waste
disposal
disposal
methods.
Noise
pollution
polition,
noise
calculatio
n of noise
Irom
different
sources.
air
pollution
sources of
air
pollution
practical
removal
methoda
memous.
thermal
pollution ·
Sources
of the
thermal
nollution
ponution.
Radioacti
ve
nollution
ponunon.

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, dailyoral, monthly, or written exams, reports .... etc

quizzes	10pt
H.W	5pt
report	5pt
term Exam	20pt
Final Exam	60pt
Total	100pt

12.Learning and Teaching Resourc	ces
Required textbooks (curricular books, if	
any)	1988.
	Metcalf and Eddy "Wastewater engineering, treatment and resource recovery", McGraw hill, New York, 2014.
Main references (sources)	Abdul Hadi Yahya Al-Sayegh and Arwa
	Shazal, "Environmental Pollution"
	Energy, 2002.
Recommended books and references (scientific journals, reports)	Al-Rafidain Engineering Journal
Electronic References, Websites	Environmental engineering
	4enveng.com

### **Course Description Form**

13.Course Name:	
14.Course Code:	
	ENV242
15.Semester / Year:	
	Autumn Semester/2023-2024
16.Description Preparat	ion Date:
	2023-2024
I/.Available Attendance	Forms:
19 Number of Credit Her	Incide the class, online
18.Number of Credit Hot	irs (10tal) / Number of Onits (10tal)
	2/2
19. Course admin name)	istrator's name (mention all, if more than one
Name: Hanan Haqi Email: <u>hanan.eng201</u> <u>Thura.azzam@</u>	Thura Azzam <u>4@uomosul.edu.iq</u> <u>uomosul.edu.iq</u>
20 Course Objectives	
Course Objectives	• During this course, the student learns about
	the tasks of an anvironmental engineer as
	the tasks of an environmental engineer, as
	well as distinguishing between the most
	common types of pollution in the
	surrounding environment.
	• Study the quality of water and solid waste
	• Briefly study drinking water units and
	wastewater treatment plants.
	• Identify noise, air, thermal and radiation
	pollution, which will be expanded upon in
	the stages of the study.
21.Teaching and Learning	g Strategies

Strate	egy				
	Th pla	ne strategy is achi atforms, and giving h	eved through lector ome and class assign	ures, e- iments.	learning
22. Cours	e Structi	ıre			
Week	Hours	Required Learning Outcomes	Unit or subject name	Learn ing metho d	Evaluatio n method
2	4	Get a general id about the concept environmental	Introduction. What's the environmental	Power int lecture	Daily exa
1	2	about Physical a chemical properties of water	of Environmental Engineer. water: chemical and physical properties	Power int	Daily ex and Homewo
1	2	Identify the mo important surfa	of water. Definition for solids found in	Power	Homewo
2	4	water pollutants an their requiremen Biochemical oxyger	water & wastewater. Classification of	int lecture	Daily exa
2	4	Applying t	particles found in water.	Power int lecture	Daily exa
1	2	balance to some common environmental	Water quality. Surface water pollution and its sources. The EPA	Power int lecture	Daily ex and
2	4	problems.	Beneficial Uses of Surface Water.		Homewo
2	4	Knowledge of t phenomenon nutrient enrichme	Biochemical Oxygen Demand.	Power int lecture	class assignme
1	2	lakes and t phenomenon	Mass Balance	Power int	a report
1	2	thermal stratification Determine the un of both drinki	Approach To Solve Environmental Problems	lecture Electro c	a report
		water treatment plants and treatme plants Waste water	steady –State condition – Conservative.	lecture	a report

		ГГ	
Knowledge of t sources a characteristics solid waste, methods disposal solid waste Identify no pollution, its harr and ways to comb it. Identify the me common types pollution in t environment, such air pollution. Knowledge thermal pollution, sources, and ways reduce its impact Waterbodies. Identify radioact contamination a ways to prevent it.	Water quality in lakes. Lakes characteristics ,Factors Controlling The Eutrophication ,Thermal Stratification and Dissolved Oxygen. Water treatment ,Water requirement:. Water consumption (components): Water treatment plant. wastewater treatment plant .,characteristics of wastewater. pretreatment units – primary treatment units . secondary treatment . Solid Waste. Sources and characteristics of Solid Waste, Solid Waste disposal methods. Noise pollution, noise meter, calculation of noise from different sources. air pollution . sources of air pollution .practical removal methods.	c lectur discus n	

		thermal Sources thermal	pollution : of the pollution.		
		Radioac pollution	tive 1.		
23.Course Evalua	ation				
Distributing the scor laily preparation, da	e out of 100 accor ilyoral, monthly, or	ding to the tasl written exams	ks assigned to , reports et	the stud	ent such as
Γ	quizze	s	10pt	]	
-	H W	-	5nt	-	
	11. **		5pt	-	
-		,	<u></u>	_	
-	term Exa	am	20pt	_	
-	Final Ex	am	60pt	_	
	Total		100nt		
			Toopt		
24.Learning and	Teaching Resourc	ces			
24.Learning and 7 Required textbooks books, if any)	Teaching Resourd (curricu Tar	ces iq Ahmed Mahm	oud "Environm	] lental Tech	nology", 1988
24.Learning and Required textbooks books, if any)	Teaching Resource (currict Tar Met	ces iq Ahmed Mahmo calf and Eddy "	oud "Environm Wastewater e	lental Tech	nology", 1988 ;, treatment a
24.Learning and 7 Required textbooks books, if any)	Teaching Resource       (currict       Tar       Met       resc       ces)     Ab       "Er	iq Ahmed Mahmu calf and Eddy " purce recovery", dul Hadi Yah nvironmental	oud "Environm Wastewater e McGraw hill, N iya Al-Saye Pollution" 1	ental Tech ngineering <u>ew York, 2</u> gh and Energy, 2	nology", 1988 3, treatment a 014. Arwa Shaz 2002.
24.Learning and Required textbooks books, if any) Main references (sour Recommended book eferences (sci ournals, reports)	Teaching Resource (currict Tar Met reso ces) Ab "Er s and Al- ientific	ces iq Ahmed Mahmo calf and Eddy " ource recovery", dul Hadi Yah nvironmental Rafidain Engi	oud "Environm Wastewater e McGraw hill, N nya Al-Saye Pollution" I	ental Tech ngineering <u>ew York, 2</u> gh and Energy, 2 irnal	nology", 1988 ;, treatment a 014. Arwa Shaz 2002.
24.Learning and Required textbooks books, if any) Main references (sour Recommended book eferences (sci ournals, reports) Electronic References	Teaching Resource       (currict)       Tar       Metress       ces)     Ab       "Er       s and     Al-       ientific       , Websi     Env	ces iq Ahmed Mahmo calf and Eddy " ource recovery", dul Hadi Yah nvironmental Rafidain Engi ironmental engin	oud "Environm Wastewater e McGraw hill, N hya Al-Saye Pollution" I ineering Jou	ental Tech ngineering <u>ew York, 2</u> gh and Energy, 2 irnal	nology", 1988 3, treatment a 014. Arwa Shaz 2002.

#### **Course Description Form**

1. 0	Course Name:
Fluids	Mechanics
2. 0	Course Code:
ENV24	7
3. S	Semester / Year:
2023-2	2024
4. E	Description Preparation Date:
18/2/2	2024
5. A	Available Attendance Forms:
6. N	Number of Credit Hours (Total) / Number of Units (Total)
3	8 theoretical +2 lab (5)/ 4
7. 0	Course administrator's name (mention all, if more than one name)
Ν	Jame: Mohammed Salim Mahmood
E	Email: mohammedsalim@uomosul.edu.iq
8. 0	Course Objectives
Course	On successful completion of this course students will be able to:
Objectiv	1-Defining the formulas that give the main parameters of fluids (i).
	2-Formulate the main equations that cover the fundamentals of concern fields
	(i).

<ul> <li>3-Applying the formulas and equations to solve different problems in various fields to give the results that can be used in different sides of engineering (ii).</li> <li>4-Correlating the theoretical principles with practical by carrying out laboratory experiments with analysis of results and discussion (iii).</li> </ul>								
9. Teaching and Learning Strategies								
Strategy	Strategy       This course has several components that include lectures, individual assignments, and e-learning platforms. The course will be taught in Engl and all mandatory assignments have to be submitted within the deadlines be admitted to the exams.							
10. CC	Hourse Su	Paguirod Loorning	Unit or subject	Looming	Evaluation			
week	nours	Outcomes	name	method	method			
2	6	Ι	Fluids properties, Fluid statics: Pressure in fluid; Types of pressure; Pressure measuring devices.	lectures, individual assignments, and e-learni platforms	Quizzes (term+Final) exams			
2	6	I , II	Pressure force on submerged plane surface; Pressure force on submerged curved surface.	lectures, individual assignments, and e-learni platforms	Quizzes (term+Final) exams			
2	6	I , II	Fluid Kinematics: Flow patterns; Continuity equation and its applications	lectures, individual assignments, and e-learni platforms	Quizzes (term+Final) exams			
3	9	I , II	Bernoulli's equation and its applications	lectures, individual assignments, and e-learni platforms	Quizzes (term+Final) exams			
2	6	I , II	Momentum equatio and its applications	lectures, individual assignments, and e-learni platforms	Quizzes (term+Final) exams			
3	9	I , II	Flow of real fluid pipe, friction loss types of problems minor losses	lectures, individual assignments, and e-learn platforms	Quizzes (term+Final) exams			

	3	I,II	Pipes	in series and	lectures,	Quizzes	
			parallel		individual	(term+Final)	
1			1		assignments.	exams	
					and e-learn	•••••	
					platforms		
11.Co	ourse Ev	aluation	1		1		
Quizes				11.67 %			
1 st mo	onthly ex	am		11.67 %			
2 <sup>nd</sup> mo	nthly exa	am		11.67%			
Fluid l	ab. Term	Exam		5 %			
Fluid la	ab. Repoi	rts		10 %			
Fluid la	ab. Final	Exam		10 %			
12.Le	arning a	und Teaching Resour	rces				
Require	d textbool	ks (curricular books, if	any)				
Main re	ferences (	sources)		Esposito, A.,	1998, Fluid I	Mechanics with	
				applications,	Prentice Hall,	Inc.	
Recomm	Recommended books and references (scientific			1.White, F. M., 1994, Fluid Mechanics, 3 <sup>rd</sup>			
journals	, reports	.)		ed MaGraw Hill Inc			
				2 Cengel V and Cimbala I 2014 Fluid			
				Machanica Fundamentals			
				Micchanics Fundamentals and			
				Applications,	, 401 equition, IV	icoraw Hill.	
Electron	ic Refere	nces. Websites					
25.Course Name:							
---	---						
Construction Materials							
26.Course Code:							
ENV244							
27.Semester / Year:							
Fall / 2023-2024							
28.Description Preparation Date:							
01/04/2024							
29. Available Attendance Forms:							
In person and electronic (Google Class	room - luup3v4)						
30.Number of Credit Hours (Total) / Nur	nber of Units (Total):						
4/2							
31. Course administrator's name (men	tion all, if more than one name):						
Name: Dr. Omar M. Abdulkareem, Ema	il: omaralhakeem@uomosul.edu.iq						
Name: Rana B. Alshahwany, Email: rn.l	ourha@uomosul.edu.iq						
32.Course Objectives:							
Course Objectives	• Identify the components of concrete;						
	• Recognize the physical and chemical						
	characteristics of the concrete						
	components;						
	• Recognize the importance of material						
	characteristics and their contributions						
	to strength development in concrete;						
	• Able to determine the tresh and the						
	hardened properties of the concrete,						
	and understanding concrete						
	performance as a good basics for the						
	building construction and the						

33.Tea Strateg	iching ai	nd Learning S Power F	Strategies: Strategies: Strategies: Strategies: Strategies: Point Presentations	gn; aboratory and addition to naterials.	tests on its o the other
34. Co Week	ourse Sti Hours	ructure: Theo Required Learning Outcomes	oretical Unit or subject name	Learning method	Evaluation method
1&2	4	Identify the components of concrete	Introduction to Concrete: Concrete definition, Concrete composition, Concrete classification, Concrete characteristics, Concrete mix ratios (Conservation of mix weight ratios to volume ratios, Rich and lean concrete mixes).	Presentation	Quiz 1
3 & 4	4	Identify the Portland cement; Recognize the physical and chemical characteristics of the cement, Recognize the importance of Portland cement characteristics and their contributions to strength development in concrete.	Cement: Cement definition, Manufacture of Portland cement, Chemical composition of Portland cement clinker, Control Ratios, Phase composition of Portland cement clinker, Physical properties of cement (Compressive strength, Setting time, Early stiffening (False set and flash set), Particle size and fineness, Soundness, Consistency, Heat of hydration, Loss on ignition, Density and relative density (Specific gravity), Bulk density), Types of Portland cement (Main types, Blended cements, Special cements).	Presentation	Quizzes 2 & 3
5	2	Identify the mixing water; Recognize the physical and chemical characteristics of the mixing water, Recognize the importance of mixing water characteristics and their contributions to concrete properties.	Mixing Water for Concrete: Introduction, Effects of impurities in mixing water on concrete properties (Alkali carbonate and bicarbonate, Chloride, Sulfates, Miscellaneous inorganic salts, Acid waters, Alkaline waters, suspended particles), Organic impurities (Waters carrying sanitary sewage, Sugar, Algae).	Presentation	Quiz 4

9       2       Identify the admixtures; Recognize the importance of admixtures, Accelerating admixtures, Accelerating admixtures, Accelerating admixtures, admixtures).       Presentation       M         9       2       admixtures trypes and their contributions to concrete properties.       Presentation       M         10, 11, 6       Able to concrete performance as a good basics for the building construction and the structural design.       Fresh Properties of Concrete: (Unit weight (Density), Yield, Cement factor).       Presentation       C         10, 11, 6       6       concrete performance as a good basics for the building construction and the structural design.       Hardened Properties of Concrete: Strength, Flexure strength, Reactors affecting, Properties of the concrete, and understanding construction and the structural design.       Hardened Properties of Concrete: Strength, Flexure strength, Flexure strength, Reactor safecting, Presentation       C         13, 14, 6       6       concrete performance as a good basics for the building construction and the structural design.       Presentation       C         13, 14, 6       6       concrete performance as a good basics for the building construction       Presentation       C         14, 14       6       concrete performance and understanding on the concrete; and understanding on the concrete building construction       Presentation       C         13, 14, 8       6       concrete performance as a good basics for the building construction       Presentation <th>nce with ance with ance with iracteristics iture, Bulk ds, Relative Presentation Quizzes 5 &amp; 6 orption and Alkali-silica ing).</th> <th>classification (In accordance with aggregate size, In accordance with aggregate source, In accordance with aggregate unit weight), Characteristics (Particle shape, Surface texture, Bulk density (unit weight) and voids, Relative density (Specific gravity), Absorption and moisture conditions, Bulking, Alkali-silica reaction (ASR), Sampling, Grading).</th> <th>aggregate; Recognize the physical and chemical characteristics of the aggregate, Recognize the importance of aggregate characteristics and their contributions to concrete properties.</th> <th>6</th> <th>6, 7, &amp; 8</th>	nce with ance with ance with iracteristics iture, Bulk ds, Relative Presentation Quizzes 5 & 6 orption and Alkali-silica ing).	classification (In accordance with aggregate size, In accordance with aggregate source, In accordance with aggregate unit weight), Characteristics (Particle shape, Surface texture, Bulk density (unit weight) and voids, Relative density (Specific gravity), Absorption and moisture conditions, Bulking, Alkali-silica reaction (ASR), Sampling, Grading).	aggregate; Recognize the physical and chemical characteristics of the aggregate, Recognize the importance of aggregate characteristics and their contributions to concrete properties.	6	6, 7, & 8
10, 11,       6       Able to determine the fresh properties of concrete: (Workability (Factors affecting, properties of the concrete, and understanding concrete (Unit weight (Density), Yield, understanding concrete (Unit weight (Density), Yield, Cement factor).       Presentation       C         10, 11,       6       concrete performance as a good basics for the building construction and the structural design.       Presentation       C         13, 14,       6       concrete as a good basics for the building construction and the structural design.       Hardened Properties of Concrete: Strength, Factors affecting, Modulus of the concrete, and concrete, eas a good basics for the building construction and the strength, Flexure strength, Modulus of the concrete, and concrete, and concrete, and concrete, and the strength, Flexure strength, Modulus of the concrete, and concrete as a good basics for the building construction the concrete, and concrete as a good basics for the building construction the properties of the concrete, and concrete and the strength, Flexure strength, Modulus of the concrete, and concrete as a good basics for the building construction at a good basics for the building construction       Presentation       C         13, 14,       6       concrete building construction       Presentation       C         as a good basics for the building construction       and concrete building construction       Presentation       C	Concrete: (Retarding admixtures, Presentation Monthly Exam 1	Chemical Admixtures for Concrete: Definition, Reasons, Classes (Retarding admixtures, Accelerating admixtures, Water-reducing admixtures).	Identify the admixtures; Recognize the importance of admixtures types and their contributions to concrete properties.	2	9
13, 14,       6       Concrete determance as a good basics for the building construction and       Hardened Properties of strength (Compressive strength, Factors affecting compressive strength, Tensile properties of strength, Flexure strength, Modulus of the concrete, elasticity, Poisson's ratio, Shrinkage, and         13, 14,       6       concrete performance as a good basics for the building construction       Presentation	Concrete: properties affecting, Bleeding, on of fresh sity), Yield, Presentation Quiz 7	Fresh Properties of Concrete: Introduction, Fresh properties (Workability (Factors affecting, Measurement), Segregation, Bleeding, Plastic shrinkage), Composition of fresh concrete (Unit weight (Density), Yield, Cement factor).	Able to determine the fresh properties of the concrete, and understanding concrete performance as a good basics for the building construction and the structural design	6	10, 11, & 12
structural	Concrete: th, Factors th, Tensile Aodulus of Shrinkage, Presentation Quiz 8	Hardened Properties of Concrete: Strength (Compressive strength, Factors affecting compressive strength, Tensile strength, Flexure strength, Modulus of elasticity, Poisson's ratio, Shrinkage, Creep).	design.Abletodetermine thehardenedpropertiesofthe concrete,andunderstandingconcreteperformanceasa goodbasicsfor thebuildingconstructionandthestructural	6	13, 14, & 15

Week	Hours	Required	Unit or subject name	Learning	Evaluation
		Learning		method	method
		Outcomes			
		Practicing	An exploratory tour of the construction		
		laboratory	materials testing laboratory to identify		
		tests on	the devices and tests available there in,		
1	2	concrete and	in addition to how to prepare the	-	-
		its	engineering report for the experiment		
		ingredients in	according to the relevant structure.		
		addition to the			
		other			
		construction			
		materials.	Chandend equainteney and initial patting		
		Practicing	standard consistency and initial setting		
2	2	tosts on	apparatus	Evneriment	Report 1
2	2	Portland		Experiment	Report
		cement.			
		Practicing	Compressive strength of the cement		
		laboratory	mortar cubes and tensile strength of the		
3	2	tests on	cement mortar brackets.	Experiment	Report 2
		Portland			
		cement.			
		Practicing	Sieve analysis of the aggregate (fine and		
4	2	laboratory	coarse).		
		tests on		Experiment	Report 3
		aggregate.			
_		Practicing	Unit weight, specific gravity, absorption		
5	2	laboratory	and moisture conditions of aggregate	<b>F</b>	Dava ant 4
		tests on	(fine and coarse).	Experiment	Report 4
		Bracticing	Properties of the fresh concrete		
6	2	laboratory	(Workability Proportion of sand Unit		
0	2	tests on fresh	weight).	Experiment	Report 5
		concrete.		_,,p eee	
		Practicing	Compressive strength of concrete using		
		laboratory	cubic and cylindrical specimens.		
7	2	tests on		Experiment	Report 6
		hardened			
		concrete.			
_		Practicing	Steel test.		
8	2	laboratory		<b>-</b>	
		tests on steel		Experiment	Report 7
		Practicing	Prick and masoney units tasts		
		laboratory	DITCK dhu masonry units lests.		
9	2	tests on hrick		Experiment	Report 8
2		and masonry		experiment	
		units.			
	1	1	Monthly Exam		I
35. Co	ourse Ev	valuation:			
8 Dail	v Exams	$(15) + 2 M_{\odot}$	nthly Exams $(30) + 8$ Reports (5)	) + Final Ex	(50)
o Dan	,	(, <u>-</u>		, - mai <b>L</b> i	
36 L	arning (	and Teaching	Resources		

Main references (sources)	<ul> <li>S. H. Kosmatka and M. L. Wilson, Design and Control of Concrete Mixtures, Portland Cement Association, Fifteenth Edition Print History, USA, 2011.</li> <li>G. Owens, Fulton's Concrete Technology, Cement &amp; Concrete Institute, Printing and Binding by Intrepid Printers (Pty) LTD, Midrand (South Africa), 2009.</li> <li>M.S. Shetty, Concrete Technology: Theory and Practice, S. Chand &amp; Company LTD. Multicolour Illustrative Edition Ram Nagar (New Delhi), 2005.</li> <li>A. M. Neville and J. J. Brooks, Concrete Technology, Pearson Education Limited, Second Edition, Essex (England) 2010.</li> </ul>
Recommended books and references	None
(scientific journals, reports)	
Electronic References, Websites	None

37.Course Name: Engineering Analysis						
38.Course Code: ENV246						
39 Sem	ester / Yea	r: spring 2023-2024				
57.5Cm		1. spring 2023-2024				
40 Doco	rintion Dro	pharation Data 2/2024				
40.Dest						
41 4	1 1 1 4					
41.Ava1	lable Atten	dance Forms:				
42.Num	ber of Cred	it Hours (Total) / Number of Units (Total) 2/2				
43.	Course a	administrator's name (mention all, if more than one				
nam	e)					
Nam	e: Dr. Salin	n Y. Awad				
Ema	il: sua@uo	mosul.edu.ig				
44.Cour	se Objectiv	'es				
Course Object	tives	• <b>Learn</b> the concept and principles of engineering analysis,				
		and the vital roles that engineering analysis plays in				
		professional engineering practices.				
		• <b>Learn</b> the need for the application of engineering analysis in				
		three principal functions of professional engineering				
		practice: creation, problem solving, and decision				
		making.				
	• Learn that engineers are expected to solve problems that					
	relate to protection of properties and public safety and also					
to make decisions.						
	Appreciate the roles that mathematics plays in engineering					
	analysis, and <b>acquire</b> the ability to use mathematical					
modeling in problem solving and decision making in dealing						
	with real physical situations.					
45.Teac	hing and Le	earning Strategies				
Strategy						
	strong emphasis on					
	how student	s will learn to apply the mathematics that they learned in previous years to				
solve engineering problems.						

46. Course Structure								
Week	Ho urs	Required Learning Outcomes	Unit or subject name	Learning method	Evalu ation metho d			
1 2 3 4 5 6 7 8 9 10 11 12 13 14	2x 15	learning	Differential Equations IntroductionFirstorderordin differential equations1-Separable varia differential equations2-Homogeneous differential equations2-Homogeneous differential equations2-Homogeneous differential equations2-Homogeneous differential equations (reducible separable DE) 3- Exact differential equation Reducible to exact differer equations4-Linear differential equations Reducible to linear differer equations''Bernoulli Equation'' 5- Second order DE Applications on First-Or ODE 1- Orthogonal Trajectories 2- Suspended Cables 3- Flow through orifices 4- Motion of bodies 5- General ApplicationsSecond and Higher Order Linear Ordinary Differential Equations Solution of non-homogeneous linear DE with constant coefficients1-Undetermined coefficients method 2- Variation of parameters method	Inter tive lectu s	u			
			Applications on Second and Higher Order Linear ODE 1. Deflection of beams 2. Buckling of columns 3. Simple Vibration					
47.Cours Quizzes 20	se Ev %	aluation						

Required textbooks (curricular books, if any)	Advanced Engineering
	Mathematics,
	by E. Kreyszig
Main references (sources)	Applied Engineering Analysis
	Tai-Ran Hsu
	San Jose State University, San Jo
	USA
Recommended books and references (scientific	Engineering Analysis / Civil Eng
journals, reports)	3rd Class Prepared by: Dr. Ahm
	Sagban Saadoon
Electronic References, Websites	

49.Course Name: Engineering Analysis

WUUK	urs	Outcom	les	onit of subject name	method	ation
58. Cours Week	se Str	ucture Require	d Learning	Unit or subject name	Learning	Evalu
	stro hov sol	ong empha w students ve enginee	asis on s will learn to ap ering problems.	oply the mathematics that they lear	rned in previous y	ears to
Strategy			uning Strat	62100		
nar Nar Em 56.Cou Course Obj	ne) ne: D ail: su arse C ectives	pr. Salim ua@uor Objective	<ul> <li>Y. Awad nosul.edu.id</li> <li>es</li> <li>Lear and th profes</li> <li>Lear three practi maki</li> <li>Lear relate to ma</li> <li>Appr analys mode with r</li> </ul>	q n the concept and principles of he vital roles that engineering a ssional engineering practices. n the need for the application of principal functions of profession ice: creation, problem solvin ing. n that engineers are expected to to protection of properties and ke decisions. reciate the roles that mathema sis, and acquire the ability to to ching in problem solving and deci- real physical situations.	engineering and nalysis plays in of engineering an onal engineering <b>ng, and decisi</b> o solve problem public safety an tics plays in eng use mathematics cision making in	alysis, nalysis in on s that nd also ;ineering al i dealing
54.INU			dministrato	or's name (mention all, if	more than or	ne
54 Nu	mher	ofCred	it Hours (To	tal) / Number of Units (Tot	tal) 2/2	
53.Ava	ailabl	e Attend	lance Forms	:		
52.Des	script	tion Pre	paration Da	ate: 2/2024		
51.Ser	neste	er / Yeai	: spring 202	23-2024		
50.000	れってい	<b>AUG.</b> 121	$N V \angle T U$			

2	2x	learning		First order ordin	tive	
3	15			differential equations 1- Separable varia	lectu	
4				differential equations	S	:
5				2- Homogeneous differer		
6				equations (reducible		
7				separable DE)		
8				Reducible to exact differen		
9				equations		
10				4- Linear differer		
11				Reducible to linear differer		
12				equations"Bernoulli		
13				Equation 7 5- Second order DE reduce		
14				first order DE		
11				Applications on First-Or		
				1- Orthogonal Trajectories		
				2- Suspended Cables		
				3- Flow through ornices 4- Motion of bodies		
				5- General Applications		
			Second	and Higher Order Linear		
			Ordina	ry		
				Differential Equations		
			Solution	n of non-homogeneous DE with constant		
			coeffici	ents		
			1 Unde	storminad coofficients		
			method	cter mineu coefficients		
			2- Vari	ation of parameters method		
			Applics	tions on Second and		
			Higher	Order Linear		
			ODE	ation of hooms		
			1. Defle 2. Buck	ling of columns		
			3. Simp	le Vibration		
59.Cours	se Ev	aluation				
Quizzes 20	%					
Mid exam 2	20%					
Final exam	60% ·					
60.Learn	ing a	and Teaching Resour	rces	. 1 1 5	• •	
Required te	xtboo	ks (curricular books, if a	any)	Advanced Eng	gineering	
				Mathematics,		
			by E. Kreyszig			
Main references (sources)		Applied Engin	eering Analysis			
				Tai-Ran Hsu		_
				San Jose State	e University, Sa	n Jo
				USA		
Recommend	ded bo	ooks and references (sci	entific	Engineering A	Analysis / Civil	Eng

journals, reports)	3rd Class Prepared by: Dr. Ahm Sagban Saadoon
Electronic References, Websites	

• 1	n class							
• E- classroom.								
66.1	66.Number of Credit Hours (Total) / Number of Units (Total):							
4	4 hour	s/4 units						
67.	(	Course administrator's nar	ne (mention	all, if more than o	ne name)			
1	Vame:	Nadia Afram Yaqoob						
1	-mail:	n.airnmanyn@uomosui.e	eau.iq					
68.0	Course	Objectives						
Course (	Objectiv	/es	nt '	••••••				
		f	This course pro	ovides students with the	e fundamentals			
		1	<ul> <li>plane analyt</li> </ul>	ic geometry (Circle, pa	rabola, Ellipse,			
			Hyperbola).					
			<ul> <li>partial deriv</li> </ul>	vatives for Functions o	f two or more			
			variables.					
			<ul> <li>Hyperbolic f</li> </ul>	function.				
			Multiple Int	egration.				
			Differential	equations $(1_{st} \text{ order } 1_{s})$	t degree).			
60.5	<b>D</b> 1'							
69.		ng and Learning Strategies	te that include	studving lectures tuto	rial discussion			
Strategy	1	nomework, and e-learning platfo	rms. The cours	se will be taught in E	inglish, and all			
	c	compulsory assignments have to	be submitted v	vithin the deadlines to	be admitted to			
	t	he exam.						
70. Co	ourse S	tructure		1				
Week	Hours	Required Learning	Unit or	Learning method	Evaluation			
		Outcomes	name		method			
1	4	Identify plane analytic	e plane	In-class lectures	Quizzes			
		geometry (Circle, Parabola	, analytic	& tutorial				
		Empse, Hyperbola)	geometry	Use e-classroom     to post lectures &				
				homework's				
4	16	Identify and understand the	derivative	<ul> <li>In-class lectures</li> <li>&amp; tutorial</li> </ul>	homework			
		function of two or more		• Use e-classroom				
		variable		to post lectures &				
		• use the partial derivatives to		homework's				
		find the maximum and	1					
		minimum of functions of	F					
		several independent	-					

(	1		1	T	1
		<ul> <li>variables (Lagrange multipliers method).</li> <li>Find the error in the dimension, area and volume and estimate the least amount of material for constructions tanks by using total differentiation for functions of two or more variable.</li> </ul>			
3	12	Identify the hyperbolic functions, their graphs, their derivatives, their integrals, and their inverse functions	Hyperbolic function identities	<ul> <li>In-class lectures &amp; tutorial</li> <li>Use e-classroom to post lectures &amp; homework's</li> </ul>	Quizzes, homework
4	16	<ul> <li>use Double integrals to find areas of more general regions in the plane</li> <li>use polar coordinates to simplify computing a double integral.</li> <li>use Triple integrals can be to find volumes of still more general regions in space</li> <li>Use double Integration to find the area, volume, mass, center of gravity, moment and moment of inertia of the functions</li> </ul>	Multiple Integration	<ul> <li>In-class lectures &amp; tutorial</li> <li>Use e-classroom to post lectures &amp; homework's</li> </ul>	Quizzes, homework
3	12	<ul> <li>Classifying differential equation</li> <li>Understand the formation and solution of ordinary differential equation</li> <li>discuss some methods for solving and approximating solutions of the (1st order</li> </ul>	Differential Equations (D.E)	<ul> <li>In-class lectures &amp; tutorial</li> <li>Use e-classroom to post lectures &amp; homework's</li> </ul>	Quizzes, homework

	1st degree) differe	ntial
	equations	
71.Course E	valuation	
6 quizzes	10pts	
4homework	4pts	
First Term Exan	n 13pts	
Second Term E	xam 13pts	
Final Exam	60pts	
Total	100pts	
72.Learning	and Teaching Resources	
Required textboo	oks (curricular books, if any)	Finney, R.L,& Thomas ,G.B, "Calculus" Addison.
		Wesley publishing company, USA,11 <sup>th</sup> ,2011
Main references	(sources)	Anton, H., Bivens, I.C., Davis, S., Calculus: Early Transcendentals, Wiley, 10th edition, 2011.
Recommended	books and references	Thomas ,G. B. &Finney ,R.L "Calculus and analytic
(scientific journa	als, reports)	geometry" Addison. Wesley publishing company, 1996.
Electronic Refer	ences, Websites	
		<u>https://www.sfu.ca/math-</u>
		coursenotes/Math%20158%20Course%20N
		<u>es/book-1.html</u>
		https://www.google.jg/books/edition/Adva
		ed Calculus of Several Variables/6eg-
		DwAAOBAI?hl=en&ghpy=1&da=calculus+of
		unction+of+several+variables+ndf&nrintsec
		ontcover
		https://youtu.be/5-CUqogfPLY

73.Course Name:
Engineering mathematics
74.Course Code:
ENV240
75.Semester / Year:
2 <sup>nd</sup> Level/ autumn course 2023-2024
76.Description Preparation Date:
18/2/2024
77. Available Attendance Forms:
• In class
• E- classroom.
78.Number of Credit Hours (Total) / Number of Units (Total):
4 hours/4 units
79. Course administrator's name (mention all, if more than one name)
Name: Nadia Afram Yaqoob

		ı.alrhmanyn@uomosul.e	edu.iq		
80.0	Course	Objectives			
81.	Teachin	g and Learning Strategies	<ul> <li>This course profor the followin</li> <li>plane analytic Hyperbola).</li> <li>partial derivic variables.</li> <li>Hyperbolic Multiple Information</li> <li>Differential</li> </ul>	ovides students with the orig topics: tic geometry (Circle, pa vatives for Functions o function. tegration. equations (1 <sub>st</sub> order 1 <sub>st</sub>	e fundamenta rabola, Ellipso f two or mor degree).
82 C	ho co th	omework, and e-learning platfo ompulsory assignments have to e exam.	rms. The cour be submitted v	rse will be taught in E within the deadlines to	nglish, and a be admitted t
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Identify plane analytic geometry (Circle, Parabola,	plane analytic	In-class lectures     & tutorial	Quizzes
		Ellipse, Hyperbola)	geometry	<ul> <li>Use e-classroom to post lectures &amp; homework's</li> </ul>	

		total differentiation for functions of two or more variable.			
3	12	Identify the hyperbolic functions, their graphs, their derivatives, their integrals, and their inverse functions	Hyperbolic function identities	<ul> <li>In-class lectures &amp; tutorial</li> <li>Use e-classroom to post lectures &amp; homework's</li> </ul>	Quizzes, homework
4	16	<ul> <li>use Double integrals to find areas of more general regions in the plane</li> <li>use polar coordinates to simplify computing a double integral.</li> <li>use Triple integrals can be to find volumes of still more general regions in space</li> <li>Use double Integration to find the area, volume, mass, center of gravity, moment and moment of inertia of the functions</li> </ul>	Multiple Integration	<ul> <li>In-class lectures &amp; tutorial</li> <li>Use e-classroom to post lectures &amp; homework's</li> </ul>	Quizzes, homework
3	12	<ul> <li>Classifying differential equation</li> <li>Understand the formation and solution of ordinary differential equation</li> <li>discuss some methods for solving and approximating solutions of the (1st order 1st degree) differential equations</li> </ul>	Differential Equations (D.E)	<ul> <li>In-class lectures &amp; tutorial</li> <li>Use e-classroom to post lectures &amp; homework's</li> </ul>	Quizzes, homework
83.Co	urse Ev	valuation			
6 auizza	20	10nts			

4homework	4pts	
First Term Exam	13pts	
Second Term Exam	13pts	
Final Exam	60pts	
Total	100pts	
84.Learning and Teac	hing Resources	
Required textbooks (curric	ular books, if any)	Finney, R.L,& Thomas ,G.B, "Calculus" Addison. Wesley publishing company, USA,11 <sup>th</sup> ,2011
Main references (sources)		Anton, H., Bivens, I.C., Davis, S., Calculus: Early Transcendentals, Wiley, 10th edition, 2011.
Recommended books (scientific journals, reports	and references)	Thomas ,G. B. &Finney ,R.L "Calculus and analytic geometry" Addison. Wesley publishing company, 1996.
Electronic References, we	USITES	https://www.sfu.ca/math- coursenotes/Math%20158%20Course%20N es/book-1.html
		https://www.google.iq/books/edition/Adva ed Calculus of Several Variables/6eq- DwAAQBAJ?hl=en&gbpv=1&dq=calculus+of- unction+of+several+variables+pdf&printsec ontcover
		https://youtu.be/5-CUqogfPLY

# MODULE DESCRIPTION FORM نموذج وصف المادة الدر اسية

Module Information معلومات المادة الدر اسية						
Module Title	Engineering S	urveying		Modu	le Delivery	
Module Type	Supported				⊠ Theory	
Module Code	<u>ENV222</u>			□ Lecture ⊠ Lab □Tutorial □ Practical		
ECTS Credits	<u>6</u>					
SWL (hr/sem)	<u>90</u>				□ Seminar	
Module Level		2	Semester of	Delivery		4
Administering Dep	artment	ENV8	College	ENG4		
Module Leader	Dr. Mohammed		e-mail	mohamn	ned1979eng@uom	osul.edu.iq
Module Leader's A	cad. Title	Assist. Professor	Module Lea	der's Qua	alification	Ph.D.
Module Tutor		e-mail	E-mail	E-mail		
Peer Reviewer Nan	ne		e-mail	E-mail		
Scientific Committee Approval Date		12/06/2023	Version Nur	nber	1.0	

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

Module	Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية					
Module Objectives أهداف المادة الدر اسية	This course aims to introduce the students to the category of Engineering surveyin . Introductory and definitions, which are used in plane surveying: Instruments for measuring distance obstacles in measurements Instruments for setting out right angles, Tape corrections. Leveling, Areas, and volumes. Computation of volumes. The Theodolite and Traverse surveying. Tachometry. Curves. Total instrument station, GFS field procedure. This will be achieved through descriptive lectures.					
Module Learning Outcomes مخرجات التعلم للمادة الدر اسية	<ul> <li>Important: Write at least 6 Learning Outcomes, it is better to be equal to the number of study weeks.</li> <li>CLO-1: The students will be able to define and distinguish the fundamentals of measuring.</li> <li>(i)</li> <li>CLO-2: after taking analysis and synthesis design processes, the student can make a primary design of some issues of roads (ii)</li> <li>CLO-3: The student will be able to conduct some tests and measurements of surveying, like elevations and coordinates using different devices. (iii)</li> <li>CLO-4: The students will be able to make suitable judgments in engineering situations surveying problems like road construction. (v)</li> <li>CLO-5: Report the data obtained from the selective topics of surveying topics given and organized during the course (iv)</li> <li>CLO-6: Creating some opinions about the emerging environmental issues and trying to give some solutions compatible with the problems related to surveying aspects (vii)</li> </ul>					
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A Introduction</u> Basic Definitions, Types of Surveying, Units, and conversions Linear measurements, tape measurements, and corrections (9 hrs) <u>Part B – Leveling</u> Leveling definitions and instruments, Leveling methods, Longitudinal and cros- sections, Contouring (21hrs) <u>Part C – Theodolites</u> Theodolites, Angles, bearings, coordinates (9 hrs) <u>Part D – Surveying topics</u> Total Station Surveying, GPS principles, Vertical Curves (6 hrs)					

Learning and Teaching Strategies						
	استراتيجيات التعلم والتعليم					
	This course has several components that include lectures, individual or group					
Strategies	assignments, rock lab visits, and e-learning platforms. The course will be taught h Arabic and English, and all mandatory reports have to be submitted within the					
	deadlines.					

Student Workload (SWL) الحمل الدر اسي للطالب محسوب لـ ١٥ اسبو عا						
Structured SWL (h/sem) الحمل الدر اسي المنتظم للطالب خلال الفصل	Structured SWL (h/sem)         93         Structured SWL (h/w)         6.2           الحمل الدر اسي المنتظم للطالب أسبوعيا         الحمل الدر اسي المنتظم للطالب خلال الفصل         6.2					
Unstructured SWL (h/sem) الحمل الدر اسي غير المنتظم للطالب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبو عيا	3.8			
Total SWL (h/sem) الحمل الدر اسي الكلي للطالب خلال الفصل		150				

	Module Evaluation							
	تقييم المادة الدر اسية							
	Time/Number     Weight (Marks)     Week Due     Relevant Learning Outcome							
Formativo	Quizzes	4	20 % (20)	3, 6, 9and 12	CLO-1, CLO-1, CLO-2 CLO-4			
assassment	Assignments	7	5% (10)		All			
assessment	Projects / Lab.	3	%5(5)					
	Report	10	10 % (10)		All			
Summative	Midterm Exam	2hr	10% (10)	7	CLO-1, CLO -2 and CLO 3			
assessment	Final Exam	3hr	50% (50)	16	All			
Total assessmen	nt		100% (100 Marks)					

Delivery Plan (Weekly Syllabus)					
	المنهاج الأسبوعي النظري				
Material Covered					
Week 1	Week 1         Basic Definitions, Types of Surveying, Units, and conversions				

Week 2	Linear measurements
Week 3	tape measurements
Week 4	corrections
Week 5	Leveling definitions and instruments
Week 6	Leveling methods
Week 7	Longitudinal and cross-sections
Week 8	Contouring
Week 9	Contouring
Week 10	Theodolites
Week 11	Angles, bearings
Week 12	coordinates
Week 13	Total Station Surveying
Week 14	GPS principles
Week 15	Vertical Curves
Week 16	The preparatory week before the Final Exam

Delivery Plan (Weekly Lab. Syllabus)						
	المنهاج الاسبوعي للمختبر					
	Material Covered					
Week 1	Area measurement by tape and guiding					
Week 2	Construct right angles in different ways					
Week 3	Projecting a building using a tape measure					
Week 4	Projecting a building using the polygon method					
Week 5	Leveling device installation					
Week 6	Leveling the ground using a leveling device					
Week 7	Leveling the ground using a leveling device					
Week 8	Longitudinal section and cross-section					
Week 9	Longitudinal section and cross-section					
Week 10	Theodolite device installation					
Week 11	Projecting a building using a Theodolite device					
Week 12	Projecting a building using a Theodolite device					
Week 13	Total station device installation					
Week 14	Use the quick functions in the Total Station device					
Week 15	Use the quick functions in the Total Station device					

Learning and Teaching Resources				
مصادر التعلم والتدريس				
Text Available in the Library				

<b>Required Texts</b>	B. Kavannagh. "Surveying with Construction Applications", 6th edition	yes
Recommended Texts	Courses from internet	Yes
Websites	https://uomosul.edu.iq/en/engineering/environmental-engineering-dept	/

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

Module Information معلومات المادة الدر اسبة						
Module Title	tle Engineering Surveying			Modu	le Delivery	
Module Type	Supported				⊠ Theory	
Module Code	<u>ENV222</u>				□ Lecture ⊠ Lab	
ECTS Credits	<u>6</u>			□Tutorial □ Practical		
SWL (hr/sem)	<u>90</u>	<u>90</u>			Seminar	
Module Level		2	Semester of	Delivery		4
Administering Dep	artment	ENV8	College	ENG4		
Module Leader	Dr. Mohammed		e-mail	mohammed1979eng@uomosul.edu.iq		osul.edu.iq
Module Leader's Acad. Title		Assist. Professor	Module Lea	ader's Qualification Ph.D.		Ph.D.
Module Tutor	Module Tutor		e-mail	E-mail		
Peer Reviewer Name			e-mail	E-mail		
Scientific Committe	ee Approval Date	12/06/2023	Version Nur	nber	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents				
	أهداف المادة الدر اسية ونتائج التعلم والمحتويات الإرشادية			
Module Objectives أهداف المادة الدر اسية	This course aims to introduce the students to the category of Engineering surveyin Introductory and definitions, which are used in plane surveying: Instruments for measuring distance obstacles in measurements Instruments for setting out rigl angles, Tape corrections. Leveling, Areas, and volumes. Computation of volumes. Th Theodolite and Traverse surveying. Tachometry. Curves. Total instrument station, GF field procedure. This will be achieved through descriptive lectures.			
Module Learning Outcomes مخرجات التعلم للمادة الدر اسية	<ul> <li>Important: Write at least 6 Learning Outcomes, it is better to be equal to the number of study weeks.</li> <li>CLO-1: The students will be able to define and distinguish the fundamentals of measurin (i)</li> <li>CLO-2: after taking analysis and synthesis design processes, the student can make primary design of some issues of roads (ii)</li> <li>CLO-3: The student will be able to conduct some tests and measurements of surveying, like elevations and coordinates using different devices. (iii)</li> <li>CLO-4: The students will be able to make suitable judgments in engineering situations surveying problems like road construction. (v)</li> <li>CLO-5: Report the data obtained from the selective topics of surveying topics given and organized during the course (iv)</li> <li>CLO-6: Creating some opinions about the emerging environmental issues and trying to give some solutions compatible with the problems related to surveying aspects (vii)</li> </ul>			
Indicative Contents المحتويات الإر شادية	Indicative content includes the following. <u>Part A Introduction</u> Basic Definitions, Types of Surveying, Units, and conversions Linear measurements, tape measurements, and corrections (9 hrs) <u>Part B – Leveling</u> Leveling definitions and instruments, Leveling methods, Longitudinal and cros sections, Contouring (21hrs) <u>Part C – Theodolites</u> Theodolites, Angles, bearings, coordinates (9 hrs) <u>Part D – Surveying topics</u> Total Station Surveying, GPS principles, Vertical Curves (6 hrs)			

Learning and Teaching Strategies					
	استر اتيجيات التعلم والتعليم				
Strategies	This course has several components that include lectures, individual or group assignments, rock lab visits, and e-learning platforms. The course will be taught Arabic and English, and all mandatory reports have to be submitted within the deadlines.				

Student Workload (SWL) الحمل الدر اسي للطالب محسوب لـ ١٥ اسبو عا						
Structured SWL (h/sem) الحمل الدر اسي المنتظم للطالب خلال الفصل	Structured SWL (h/sem)         93         Structured SWL (h/w)         6.2           الحمل الدر اسي المنتظم للطالب أسبو عيا         الحمل الدر اسي المنتظم للطالب خلال الفصل         6.2					
Unstructured SWL (h/sem) الحمل الدر اسي غير المنتظم للطالب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.8			
Total SWL (h/sem) الحمل الدر اسي الكلي للطالب خلال الفصل	150					

	Module Evaluation تقييم المادة الدر اسية						
	Time/Number     Weight (Marks)     Week Due     Relevant Learning Outcome						
Formativo	Quizzes	4	20 % (20)	3, 6, 9and 12	CLO-1, CLO-1, CLO-2 CLO-4		
	Assignments	7	5% (10)		All		
assessment	Projects / Lab.	3	%5(5)				
Report		10	10 % (10)		All		
Summative	Midterm Exam	2hr	10% (10)	7	CLO-1, CLO -2 and CLO 3		
	Final Exam	3hr	50% (50)	16	All		
Total assessmen	it	•	100% (100 Marks)				

	Delivery Plan (Weekly Syllabus)				
المنهاج الأسبوعي النظري					
	Material Covered				
Week 1	Basic Definitions, Types of Surveying, Units, and conversions				
Week 2	Linear measurements				
Week 3	tape measurements				

Week 4	corrections	
Week 5	Leveling definitions and instruments	
Week 6	Leveling methods	
Week 7	Longitudinal and cross-sections	
Week 8	Contouring	
Week 9	Contouring	
Week 10	Theodolites	
Week 11	Angles, bearings	
Week 12	coordinates	
Week 13	Total Station Surveying	
Week 14	GPS principles	
Week 15	Vertical Curves	
Week 16	The preparatory week before the Final Exam	

Material CoveredWeek 1Area measurement by tape and guidingWeek 2Construct right angles in different waysWeek 3Projecting a building using a tape measureWeek 4Projecting a building using the polygon methodWeek 5Leveling device installationWeek 6Leveling the ground using a leveling deviceWeek 7Leveling the ground using a leveling deviceWeek 8Longitudinal section and cross-sectionWeek 9Longitudinal section and cross-sectionWeek 10Theodolite device installationWeek 11Projecting a building using a Theodolite deviceWeek 12Projecting a building using a Theodolite deviceWeek 13Total station device installationWeek 14Use the quick functions in the Total Station deviceWeek 15Use the quick functions in the Total Station device		Delivery Plan (Weekly Lab. Syllabus)					
Material CoveredWeek 1Area measurement by tape and guidingWeek 2Construct right angles in different waysWeek 3Projecting a building using a tape measureWeek 4Projecting a building using the polygon methodWeek 5Leveling device installationWeek 6Leveling the ground using a leveling deviceWeek 7Leveling the ground using a leveling deviceWeek 8Longitudinal section and cross-sectionWeek 9Longitudinal section and cross-sectionWeek 10Theodolite device installationWeek 11Projecting a building using a Theodolite deviceWeek 12Projecting a building using a Theodolite deviceWeek 13Total station device installationWeek 14Use the quick functions in the Total Station deviceWeek 15Use the quick functions in the Total Station device		المنهاج الاسبوعي للمختبر					
Week 1Area measurement by tape and guidingWeek 2Construct right angles in different waysWeek 3Projecting a building using a tape measureWeek 4Projecting a building using the polygon methodWeek 5Leveling device installationWeek 6Leveling the ground using a leveling deviceWeek 7Leveling the ground using a leveling deviceWeek 8Longitudinal section and cross-sectionWeek 9Longitudinal section and cross-sectionWeek 10Theodolite device installationWeek 11Projecting a building using a Theodolite deviceWeek 12Projecting a building using a Theodolite deviceWeek 13Total station device installationWeek 14Use the quick functions in the Total Station deviceWeek 15Use the quick functions in the Total Station device		Material Covered					
Week 2Construct right angles in different waysWeek 3Projecting a building using a tape measureWeek 4Projecting a building using the polygon methodWeek 5Leveling device installationWeek 6Leveling the ground using a leveling deviceWeek 7Leveling the ground using a leveling deviceWeek 8Longitudinal section and cross-sectionWeek 9Longitudinal section and cross-sectionWeek 10Theodolite device installationWeek 11Projecting a building using a Theodolite deviceWeek 12Projecting a building using a Theodolite deviceWeek 13Total station device installationWeek 14Use the quick functions in the Total Station deviceWeek 15Use the quick functions in the Total Station device	Week 1	Area measurement by tape and guiding					
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Week 4Projecting a building using the polygon methodWeek 5Leveling device installationWeek 6Leveling the ground using a leveling deviceWeek 7Leveling the ground using a leveling deviceWeek 8Longitudinal section and cross-sectionWeek 9Longitudinal section and cross-sectionWeek 10Theodolite device installationWeek 11Projecting a building using a Theodolite deviceWeek 12Projecting a building using a Theodolite deviceWeek 13Total station device installationWeek 14Use the quick functions in the Total Station deviceWeek 15Use the quick functions in the Total Station device	Week 3	Projecting a building using a tape measure					
Week 5Leveling device installationWeek 6Leveling the ground using a leveling deviceWeek 7Leveling the ground using a leveling deviceWeek 8Longitudinal section and cross-sectionWeek 9Longitudinal section and cross-sectionWeek 10Theodolite device installationWeek 11Projecting a building using a Theodolite deviceWeek 12Projecting a building using a Theodolite deviceWeek 13Total station device installationWeek 14Use the quick functions in the Total Station deviceWeek 15Use the quick functions in the Total Station device	Week 4	Projecting a building using the polygon method					
Week 6Leveling the ground using a leveling deviceWeek 7Leveling the ground using a leveling deviceWeek 8Longitudinal section and cross-sectionWeek 9Longitudinal section and cross-sectionWeek 10Theodolite device installationWeek 11Projecting a building using a Theodolite deviceWeek 12Projecting a building using a Theodolite deviceWeek 13Total station device installationWeek 14Use the quick functions in the Total Station deviceWeek 15Use the quick functions in the Total Station device	Week 5	Leveling device installation					
Week 7Leveling the ground using a leveling deviceWeek 8Longitudinal section and cross-sectionWeek 9Longitudinal section and cross-sectionWeek 10Theodolite device installationWeek 11Projecting a building using a Theodolite deviceWeek 12Projecting a building using a Theodolite deviceWeek 13Total station device installationWeek 14Use the quick functions in the Total Station deviceWeek 15Use the quick functions in the Total Station device	Week 6	Leveling the ground using a leveling device					
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Week 12Projecting a building using a Theodolite deviceWeek 13Total station device installationWeek 14Use the quick functions in the Total Station deviceWeek 15Use the quick functions in the Total Station device	Week 11	Projecting a building using a Theodolite device					
Week 13Total station device installationWeek 14Use the quick functions in the Total Station deviceWeek 15Use the quick functions in the Total Station device	Week 12	Projecting a building using a Theodolite device					
Week 14       Use the quick functions in the Total Station device         Week 15       Use the quick functions in the Total Station device	Week 13	Total station device installation					
Week 15         Use the quick functions in the Total Station device	Week 14	Use the quick functions in the Total Station device					
	Week 15	Use the quick functions in the Total Station device					

Learning and Teaching Resources مصادر التعلم والتدريس				
	Text     Available in the Librar			
Required Texts	B. Kavannagh. "Surveying with Construction Applications", 6th edition	yes		

Recommended	Courses from internet	Ves
Texts		105
Websites	https://uomosul.edu.iq/en/engineering/environmental-engineering-dep	ot/

Grading Scheme مخطط الدرجات					
Group	Grade	التقدير	Marks %	Definition	
	A - Excellent	امتياز	90 - 100	Outstanding Performance	
~ ~	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors	
Success Group	C - Good	جيد	70 - 79	Sound work with notable errors	
(30 - 100)	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings	
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria	
Fail Group (0 – 49)	FX – Fail	ر اسب (قيد المعالجة)	(45-49)	More work is required but credit awarded	
	F – Fail	ر اسب	(0-44)	A 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-pars fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

85.Course Name:					
Construction Materials					
86.Course Code:					
ENV244					
87.Semester / Year:					
Fall / 2023-2024					
88.Description Preparation Date:					
01/04/2024					
89. Available Attendance Forms:					
In person and electronic (Google Class	room - luup3v4)				
90.Number of Credit Hours (Total) / Nur	nber of Units (Total):				
4/2					
91. Course administrator's name (men	tion all, if more than one name):				
Name: Dr. Omar M. Abdulkareem, Ema	il: omaralhakeem@uomosul.edu.iq				
Name: Rana B. Alshahwany, Email: rn.l	ourha@uomosul.edu.iq				
92.Course Objectives:					
Course Objectives	• Identify the components of concrete;				
	• Recognize the physical and chemical				
	characteristics of the concrete				
	components;				
Recognize the importance of material					
characteristics and their contributions					
to strength development in concrete;					
	• Able to determine the fresh and the				
	hardened properties of the concrete,				
	and understanding concrete				

93.Tea Strateg	ching an	nd Learning S Power F	performance a building con structural desig • Practicing 1 concrete ingredients in construction m Strategies: Point Presentations	s a good ba nstruction gn; aboratory and addition to naterials.	sics for the and the tests on its the other
94. Co Week	ourse Str Hours	ructure: Theo Required Learning	oretical Unit or subject name	Learning method	Evaluation method
1	4	Identify the components of concrete	Introduction to Concrete: Concrete definition, Concrete composition, Concrete classification, Concrete characteristics, Concrete mix ratios (Conservation of mix weight ratios to volume ratios, Rich and lean concrete mixes).	Presentation	Quiz 1
2, 3, & 4	6	Identify the Portland cement; Recognize the physical and chemical characteristics of the cement, Recognize the importance of Portland cement characteristics and their contributions to strength development in concrete	Cement: Cement definition, Manufacture of Portland cement, Chemical composition of Portland cement clinker, Control Ratios, Phase composition of Portland cement clinker, Physical properties of cement (Compressive strength, Setting time, Early stiffening (False set and flash set), Particle size and fineness, Soundness, Consistency, Heat of hydration, Loss on ignition, Density and relative density (Specific gravity), Bulk density), Types of Portland cement (Main types, Blended cements, Special cements).	Presentation	Quiz 2, & 3
5	2	In concrete Identify the mixing water; Recognize the physical and chemical characteristics of the mixing water, Recognize the importance of mixing water characteristics and their contributions to concrete	Mixing Water for Concrete: Introduction, Effects of impurities in mixing water on concrete properties (Alkali carbonate and bicarbonate, Chloride, Sulfates, Miscellaneous inorganic salts, Acid waters, Alkaline waters, suspended particles), Organic impurities (Waters carrying sanitary sewage, Sugar, Algae).	Presentation	Quiz 4

		properties	1		
6, 7, & 8	6	Identify the aggregate; Recognize the physical and chemical characteristics of the aggregate, Recognize the importance of aggregate characteristics and their contributions to concrete properties	Aggregates in Concrete: Definition classification (In accordance with aggregate size, In accordance with aggregate source, In accordance with aggregate unit weight), Characteristics (Particle shape, Surface texture, Bulk density (unit weight) and voids, Relative density (Specific gravity), Absorption and moisture conditions, Bulking, Alkali-silica reaction (ASR), Sampling, Grading).	Presentation	Quiz 5, & 6
9	2	Identify the admixtures; Recognize the importance of admixtures types and their contributions to concrete properties	Chemical Admixtures for Concrete: Definition, Reasons, Classes (Retarding admixtures, Accelerating admixtures, Water-reducing admixtures).	Presentation	Monthly Exam 1
10, 11, & 12	6	Able to determine the fresh properties of the concrete, and understanding concrete performance as a good basics for the building construction and the structural design.	Fresh Properties of Concrete: Introduction, Fresh properties (Workability (Factors affecting, Measurement), Segregation, Bleeding, Plastic shrinkage), Composition of fresh concrete (Unit weight (Density), Yield, Cement factor).	Presentation	Quiz 7
13, 14, & 15	6	Able to determine the hardened properties of the concrete, and understanding concrete performance as a good basics for the building construction and the structural	Hardened Properties of Concrete: Strength (Compressive strength, Factors affecting compressive strength, Tensile strength, Flexure strength, Modulus of elasticity, Poisson's ratio, Shrinkage, Creep).	Presentation	Quiz 8

Final Exam							
Course Structure: Experimental							
Week	Hours	Required	Unit or subject name	Learning	Evaluation		
		Learning	3	method	method		
		Outcomes					
		Practicing	An exploratory tour of the construction				
		laboratory	materials testing laboratory to identify				
		tests on	the devices and tests available there in,				
1	2	concrete and	in addition to how to prepare the	-	-		
		its	engineering report for the experiment				
		ingredients in	according to the relevant structure.				
		addition to the					
		other					
		construction					
		materials.	Chandrad consistences and initial actions				
		Practicing	standard consistency and initial setting				
2	2	tests on	annaratus	Evneriment	Report 1		
2	2	Portland		Lyperintent	Report 1		
		cement.					
		Practicing	Compressive strength of the cement				
		laboratory	mortar cubes and tensile strength of the				
3	2	tests on	cement mortar brackets.	Experiment	Report 2		
		Portland					
		cement.					
		Practicing	Sieve analysis of the aggregate (fine and				
4	2	laboratory	coarse).				
		tests on		Experiment	Report 3		
		aggregate.					
5	С	Internet	onic weight, specific gravity, and				
J	2	tests on	(interation of aggregate (interation	Experiment	Report 4		
		aggregate.		Experiment			
		Practicing	Properties of the fresh concrete				
6	2	laboratory	(Workability, Proportion of sand, Unit				
		tests on fresh	weight).	Experiment	Report 5		
		concrete.					
		Practicing	Compressive strength of concrete using				
		laboratory	cubic and cylindrical specimens.				
7	2	tests on		Experiment	Report 6		
		hardened					
		concrete.	Chaol toot				
o	р	Practicing	Steel lest.				
0	Z	tests on steel		Experiment	Report 7		
		reinforcement.		Experiment	Report /		
		Practicing	Brick and masonry units tests.				
		laboratory	,,				
9	2	tests on brick		Experiment	Report 8		
		and masonry					
units.							
Monthly Exam							
95. Co	ourse Ev	aluation:					
8 Daily	y Exams	(15) + 2 Mo	nthly Exams $(30) + \overline{8 \text{ Reports } (5)}$	) + Final Ex	am(50)		
06 L a	arning	and Teaching	Resources:	, 	, <i></i>		

Required textbooks (curricular books, if any)	None
Main references (sources)	<ul> <li>S. H. Kosmatka and M. L. Wilson, Design and Control of Concrete Mixtures, Portland Cement Association, Fifteenth Edition Print History, USA, 2011.</li> <li>G. Owens, Fulton's Concrete Technology, Cement &amp; Concrete Institute, Printing and Binding by Intrepid Printers (Pty) LTD, Midrand (South Africa), 2009.</li> <li>M.S. Shetty, Concrete Technology: Theory and Practice, S. Chand &amp; Company LTD. Multicolour Illustrative Edition Ram Nagar (New Delhi), 2005.</li> <li>A. M. Neville and J. J. Brooks, Concrete Technology, Pearson Education Limited, Second Edition, Essex (England) 2010.</li> </ul>
Recommended books and references	None
(scientific journais, reports)	
Electronic References, Websites	None



	Сог	rse Description Forn	n		
1.	Course	Name:			
PUP	LIC S	AFETY			
2.	Course	Code:			
ENGE	2329				
3	Semest	er / Year·			
Autun	n seme	ster/2023-2024			
4.	Descrip	tion Preparation Date:			
2023-2	2024	4 4 4 33			
5.	Availat	ble Attendance Forms:			
6	Number	r of Credit Hours (Total) /	Number of Units (Total)		
0.	1 (unioe				
	2/2				
7.	Course	administrator's name (	mention all, if more than c	one name)	
	Name:	Hanan Haqi Ismael T	hura Azzam Abed		
	Eman. <u>–</u> T	hura.azzam@uomosul.e	du.ia		
	<u> </u>		<u>aanq</u>		
	~				
8.	Course Objective	Objectives	· · · · · 1 · 1	• 41	
Course	Objective	• ]]	the course aims to teach the e	ngineer the co	ncept of
		pt	f human davalanment and nu	blic life	
			blic safety and its relationsh	unto nublic he	alth and
			cupational safety	np to public he	
		• th	e objectives of public safety	its laws and 1	egislation
					<b>6</b> 5151 <b>4</b> (1011)
		• 10	dentify the results of work in	public safety.	
9.	Teachir	g and Learning Strategies	5		
	St	rategy			
		The strategy is a	achieved through lectures	, e-learning p	olatforms,
		and giving home	and class works.		
10 C	ourse Si	ructure			
Week	Hours	Required Learning	Unit or subject name	Learning	Evaluation
4	0	Outcomes	T 4 1 4 1 1	method	method
	Z	I parn about the concer	introduction: It includes	PowerPoint	Daily exan
		of safety	concept of safety and its		
<u> </u>	<u> </u>		1	1	
			— 1 —		

2	4	And its relationship to public and occupational healt Learn about the most important legislation and laws Public safety determining	role in the system of human development and public life, the definition of public and occupational safety and its relationship to public and occupational health.	PowerPoint lecture	Daily exan
2	4	Responsibilities The employer, the workers and the relationship between them.	an overview of the OSHA organization in occupational safety and health management and	PowerPoint lecture	Daily exan
2	4	Demonstrate the ability to lead and participate Productively in group situations.	its objectives And its legislations in defining the responsibilities of the employer and the workers	PowerPoint lecture	Daily exan
2	4	supervisor Health and occupation doctor in addition Duties of each engineer The contractor and the official.	and their definition of the work environment and the worker and the relationship between them,	PowerPoint lecture	Daily exan
2	4	Know the most importa management functions in detail	Definition of public administration and its five functions Public safety	PowerPoint lecture	Daily exan
1	2	Knowledge of the objectives and areas of compatibility engineeri Culture and national safety strategy the public.	management. Determining the public safety committees and their tasks, the tasks of the public health and safety supervisor, the tasks of the work site doctor, the safety measures to be taken in the implementation of the project, the duties of the	laboratory discussion	Class worł Home wor
1	2		engineer, the contractor		
1	2	Know the appropriate work environment to achieve Occupational safety and health conditions.	and the security . Management functions A detailed explanation of the function: planning, organizing, staffing, trainin control, supervision, follow up and their components.	PowerPoint lecture	Report
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1	2	Know the most importa means of personal protection To ensure that public safety conditions are m	Human factors engineering adaptation 1. Its objectives and fields 2. The National Strategy for Public Safety and Occupational Health and Securing the Work	PowerPoint lecture And discussion	Report
		Identify the most important signs Indicative and warning methods first aid .	<ul> <li>3. The culture of public safety and the factors of its success and failure and its impac on the behavior of th individual and societ</li> </ul>		
		Identify the types of risks that affect On human life and how to prevent Of which	proper working environment 1. The main factors affecting the work environment and its components 2. Responsibility for implementing the occupational safety and health program in the workplace 3. Responsibilities of the Employer and Workers		
		Knowledge of physical hazards Chemical hazards and damages and resulting injuries	Personal protective equipment, its importance, advantages, shortcomings		

and types.
General safety and first aid signs
1. Identify the shapes, colors, and illustrations of safety signs and their installation locations.
2. Definition of first aid, its importance, objectives, instructions, foundations for its success, and factors affecting it.
3. Influencing factors such cleanliness, slipping, trippin and falling.
Risk Management1. Objectives and stages of risk management, types of risks, and ways to control and prevent these risks.2. What are the accidents and the consequences of these accidents?
Physical hazards and chemical hazards 1. An introductory introduction to physical hazards, their causes, and damages and injuries resulting from them. 2. Safety methods in laboratories, workshops, mechanical equipment and factories.

		0	hemical ha	zards their		T
			nonnear na	zarus, men		
			causes, dam	ages and		
		11	njuries resu	lting from		
		t	hem.			
11.Course Evaluation		·				
Distributing the score out o	of 100 acc	cording to	the tasks as	signed to the stu	ident such as dai	ilv
preparation, dailyoral, mon	thly, or v	written exa	ams, reports	etc		5
	<u> </u>	• (	1 0 ()			
	four qui	izzes, (ea	ch 2pt)	8		
	tow .H.	W(each 1	l. pt.)	2		
	report			10		
	term Ex	xam		20pt		
	Final F	vam		60nt	_	
		Xalli		ουρι		
	Total			100pt		
12.Learning and Teach	ing Resc	ources				
Required textbooks (curricul	ar boo C	Code of pi	ublic safety	in the implem	entation of cor	struction
if any)	n	rojects (I	radi constru	iction code) is	sued by the Mi	nistry of
		<sup>T</sup> onstructi	aqi constre	~ Municipalit	include by the mini-	Works with
		OllSliucu	1011, 11005111	g, municipant	2015 (a had	WOIKS WITH
	t n	he Minist	ry of Plann	ing / first editi	on 2015 (a basi	lC
	m	nethodolo	ogical book	for safety mat	erial).	
Main references (sources)		notl	hing			
Recommended books and		Ara	h Safety M	agazine		
references (scientific journals,			D Darcey 14	agazine		
reports)						
Electronic References, Webs	sites	Ara	h Institute	for Safety Sci	ences - Aiss	
,		ma	https:// a	iss co/	chees miss	
			nups.// a	155.00/		

1.	Course	e Name:					
	Statistics						
2.	Course	e Code:					
	ENV3	14					
3.	Semes	ter / Year:					
	First/ 2	2023-2024					
4.	Descri	ption Preparation	n Date:				
	1/10/2	023					
5.	Availa	ble Attendance I	Forms:				
	In clas	S					
6.	Numb	er of Credit Hou	rs (Total)	) / Number of Units (Total)			
	2 hour	s per week/ total	units 2	· · · ·			
7.	Course	e administrator's	name (m	nention all, if more than one	name)		
	Name	Prof. Abdulmuł	nsin Sadu	ıllah Shihab	,		
	Email	: mss_qzz@uom	osul.edu.	iq			
8.	Cours	e Objectives					
Course	Objecti	ves	Define the p	procedure of data collection in a sci	entific way a	nd how to	
			lescribe it	obability distributions and its benef	ite in statistic		
			Application	of normal distribution in statistical	tests	<i>,</i> 3	
		]	Explain hov	w to test claims			
			Outline hov	v to find the relationships between v	ariables		
9.	Teach	ing and Learning	, Strategi	es			
Strateg	y L	earning and teachin	g strategie	s are based on a detailed present	ation of the	material	
	W	ith examples and di	scussion i	n the classroom, with the student	's evaluation	n through	
	sh	ort and oral exams	and home	work with one or more semester	exams and	then the final	
10. C	Course	Structure					
Week	Hours	Required Learnin	g	Unit or subject name	Learning	Evaluation	
		Outcomes	-		method	method	
1	2	The student will have	e an idea	Introduction	By attending		
2	2	about the science of s	statistics	Frequency distribution	class, paying	Using	
3+4	4 and able to represent the data			Central tendency and variation tools	attention,	daily	
5+6	4	and use the tools of c	entral	Probability principles: rules and laws	discussing,	quizzes,	
7	2	Tendency and disper	sion and	Application of probability laws	asking,	oral tests	
8+9	4	he can use the probal	bility laws	Combinatorial analysis	solving	homework	
10	2	and apply normal dis	stribution	Discrete probability distributions	homework	semester	
11-12	4	and test the hypothes	is and	Normal distribution and application	and reading	and	

		_				1		
13-14	4	find the correlation between	Hypot	hesis testing	scientific	final exams		
15	2	The variables	Correl	ation, Chi-square test	sources			
11.0	Course	Evaluation						
Distrib	Distributing the score out of 100 according to the tasks assigned to the student such as daily							
prepar	ation, c	daily oral, monthly, or written	exams,	, reports etc				
Task				Score				
Quizze	es			6 x 3 = 18				
On site	e			3				
Homey	work			$3 \ge 5 = 15$				
Report	ţ			4				
Semes	ter exa	m		10				
Final e	exam			50				
Total				100				
12.L	Learni	ng and Teaching Resource	es					
Requir	red text	tbooks (curricular books, if any	y) []	Introduction to Statistic	s/ Al-Rawi K	H.		
Main r	eferen	ces (sources)						
Recom	nmende	ed books and references (scien						
journa	ls, repo	orts)						
Electro	onic Re	eferences, Websites		Statistics for Environmental Engineers 2nd Ed,				
			(	CRC Press				

Week Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method		
10. Course	Structure					
Strategy	This course has several compo group assignments, case study	onents that include power y report and e-learning pla	point lectures, ind tforms.	ividual &		
9. Teach	ing and Learning Strateg	ies				
<ul> <li>Course Objectives</li> <li>Identify the sources of noise pollution</li> <li>Describe the physical properties of sound</li> <li>Understand the factors affecting noise propagation outdoor</li> <li>Apply physical characteristics of sound wave in the description of sound propagation in the air</li> <li>Compare between the concepts involved in noise control technologies</li> <li>Advise on methods of noise reduction and sound insulation for a range of situations</li> <li>Design road way barrier used to reduce noise level produced by transportation</li> <li>Submit a report on noise prediction in specified road way configuration (Case study)</li> </ul>						
February 2024         5. Available Attendance Forms:         In-person lecture         6. Number of Credit Hours (Total) / Number of Units (Total)         2/2         7. Course administrator's name (mention all, if more than one name)         Name: Ammar Thamir Hamad         Email: dr.ammarthamir@uomosul.edu.iq         8. Course Objectives						
Spring/2024 4. Descr	iption Preparation Date	:				
3. Semes	ster / Year:					
2. Cours ENV390	e Code:					
Noise pollution	Noise pollution					
1. Cours	e Name:					

1

1.2     4     • Describe the physical properties of sound source and intensity sound power and intensity levels and the decibe characterization of noise     Power point lecture, Video learning, sound power and intensity levels and the decibe characterization of noise     Quiz       34     4     • Identify the various rating systems used for the description of noise data deciberia and unbearing effect of sound son people and criteria magnetic study     Power point lecture, Case Study     H.W.       56     4     • Understand both bearing and unbearing effect of sound son peoples     Fffects of raise on people and criteria Annayance, Sileo Imeriference Effects on Peorper point lecture Annayance, Sileo Imeriference Effects on Peorper point lecture Annayance, Sileo Imeriference Effects on Peorper point lecture Annayance, Sileo Imeriference Transmission of sound outdoor     Power point lecture Annayance, Sileo Imeriference Prover point lecture Annayance, Sileo Imeriference Transmission for and the deciber produced by transportation Source on Discussion     Power point lecture, Group Discussion     Power point lecture, Group Discussion       7.11     10     • Compare between the concept stransportation Source on produced by transportation Path, see Source by Design, Noise Control of Noise Contro	r	r	Γ				
1-2     4     • Describe the physical properties of sound oper and intensity lecture, Video properties of sound sound prover and intensity lecture, Video learning     Quiz       3-4     4     • Identify the various rating systems used for the description of noise data detecheits the Ln concept he Leq elearning in the Ln concept he Leq incurrence in the lecture, Case Study     Power point lecture, Case Study     Asignments Report       5-6     4     • Understand both hearing and unhearing effect of sounds on people and criteria Hearing inpairment, Damage-Risk Criteria, Speech Interference, Effects on Performance, Noise Standurds.     Power point lecture     Quiz       7-11     10     • Understand the factors affects on a sound porgention in the factors in the description of noise control octoor people in the factors affects on Performance, Noise Standurds.     Power point lecture is sound sound outdoor     Power point lecture is sound sound insulation for a name of sound progention in the isolation or folds of a Sound Source by produced by transportation Path.     Power point lecture, Group Discussion     Power point lecture, Group Discussion Taffic noise prediction       12-15     8     • Compare between the concerest involved in noise control bechnologies involved in noise data 100 pts     Power point lecture       12-15     8     • Compare between the concerest involved in noise control bechnologies involved in noise contr				Introduction: Properties of sound waves,	Power point		
1     1 <td>1-2</td> <td>4</td> <td>• Describe the physical properties of sound</td> <td>sound power and intensity</td> <td>lecture, Video</td> <td>Quiz</td>	1-2	4	• Describe the physical properties of sound	sound power and intensity	lecture, Video	Quiz	
34       4       Identify the various rating systems used for the description of noise data description descriptis description description			1 1	levels and the decibel, characterization of noise	learning		
34     4     systems used for the description of noise data description of noise data both hearing and unhearing effect of sounds on peoples     Effects of noise on people and criteria Hearing Impairment, Damage Risk Criteria, Speech Interference, Annoyance, Sleep Interference, Annoyance, Sleep Interference, Annoyance, Sleep Interference, Annoyance, Sleep Interference, Noise Standards     Power point lecture     Quiz       7-11     10     • Understand the factors affecting noise propagation outdoor     • Transmission of sound propagation in teair outdoor     • Power point lecture, Case Heat Prover point lecture     • Power point lecture     • Quiz       12-15     8     • Compare between the concrepts involved in noise control technologies situations     • Noise control Source-Path-Receiver     • Power point lecture     • Quiz       12-15     8     • Compare between the concrepts involved in noise control technologies situations     • Power point lecture     • Quiz       12-15     8     • Otype     • Advise on methods of moise reductio and Source     • Power point lecture     • Po			• Identify the various rating	Rating systems	Power point	H.W.	
1     Understand both hearing and unhearing effect of sounds on peoples     Effects of noise on people and criteria Hearing limpimment, Damage-Risk Criteria, Speech Interference, Annoyance, Sleep Interference, Ffects on Performance, Noise Standards     Power point locture     Quiz       7-11     10     • Understand the factors affecting noise propagation outdoor     Transmission of sound outdoors     Power point hearing and unhearing effect of sound yearse Square Law, Rediation Fields of a Sound Source Directivity, Ariborne Transmission, Traffic noise prediction     Power point locture     H.W       7-11     10     • Compare between the concepts involved in noise control technologies     Transmission of sound outcors     Power point locture     Power point locture       12-15     8     • Compare between the concepts involved in noise control technologies     Noise control Source by Design, Noise Control of Noise Source by Design, Noise Control of Noise Source by Redress, Protect the Receiver     Power point lecture     Quiz       11.     Course Evaluation     • A typis     Introduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5" ed. (2013)       12.     Learning and Teaching Resources     Introduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5" ed. (2013)       12.     Learning and Teaching Resources     Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)       Required textbooks (curricular books and references (scientific journals, reports)     Engineering noise control, theory and practice by Bies and Hansen, 4th ed.	3-4	4	systems used for the	the Ln concept, the Leq	lecture, Case	Assignments	
5-64• Understand both hearing and unhearing effect of sounds on peoplesand criteria Hearing Impairment, Damage-Risk Criteria, Speech Interference, Interference, Noise StandardsPower point lectureQuiz7-1110• Understand the factors affecting noise propagation outdoor • Apply physical characteristics of sound wave in the description of sound propagation in the air • Design road way burrier • Compet burber of to Noise • Compet burber of to Noise • Courcept Control of Noise • Courcept Control of Noise • Courcept Control of Noise • Courc			description of noise data	Effects of noise on people	Study	Кероп	
56     4     hearing and unhearing effect of sounds on peoples     Damage Risk Citeria, Speech Interference, Effects on Performance, Noise Standards     Power point locture     Quiz       7.11     10     • Understand the factors afficcting noise propagation outdoor     • Apply physical characteristics of sound wave in the description of sound propagation in the air used to reduce noise level produced by transportation     Transmission of sound outdoors     Power point iccture     Power point power point outdoors       12-15     8     • Compare between the concepts involved in noise control technologies     Noise control Source Path Receiver     Power point instalion frictids of a Sound Source path Receiver     Power point iccture, Group Discussion     Power point iccture, Group Discussion       12-15     8     • Compare between the concepts involved in noise control technologies     Source Path Receiver     Power point instalion for a range of noise reduction and sound instalion for a range of situations     Source Path Receiver     Power point lecture     Quiz       11.     Course Evaluation     Variange of situation for a range of situat			• Understand both	and criteria			
5-6     4     effect of sounds on peoples     Speech Interference, Annoyane, Sleep Interference Effects on Performance, Noise Standards     Investe Power point outdoor     Quiz       7-11     10     Understand the factors affecting noise propagation outdoor     Transmission of sound outdoors     Power point lecture     Power point power point sound propagation in the air sound propagation in the air prediction produced by transportation     Power point Source Path-Receiver Concept, Control of Noise Source by Design, Source by Mackenziz Davis, S <sup>6</sup> ed. (2013)     Power point lecture       11.     Course     10 pts     Introduction to Environmental Engineering "Chapter -10" by Mackenziz Davi			hearing and unhearing	Damage-Risk Criteria,	Power point		
12-15       8       • Understand the factors affecting noise propagation outdoor       • Understand the factors affecting noise propagation outdoor       • Understand the factors affecting noise propagation outdoors       • Understand the factors affecting noise propagation outdoors       • Power point lecture, Group Discussion       • Power point lecture, Group Discussion       • H.W.         7-11       10       • Compare between the concepts involved on in noise control or Noise control       • Noise control       • Source by Design, Noise Control of Noise Source by Rederess, Protect the Receiver       • Power point lecture       • Quiz         11.       Course Evaluation       • Apts Concept, Control of Noise Source by Rederess, Protect the Receiver       • Power point lecture       • Quiz         12-15       8       • Compare between the concepts involved and sound insulation for a range of situations       • Noise Control of Noise Control of Noise Source by Rederes, Protect the Receiver       • Quiz         12-15       8       • Compare between the concepts involved and sound insulation for a range of situations       • Noise Control of Noise Control of Noise Control of Noise Source by Redress, Protect the Receiver       • Quiz         11.       Course Evaluation       • Interdit	5-6	4	effect of sounds on	Speech Interference,	lecture	Quiz	
Image: state in the state in			peoples	Interference			
7-11       10       • Understand the factors affecting noise propagation outdoor <b>Transmission of sound</b> outdoors       Power point lecture, Group Discussion         7-11       10       • Design road way barrier used to reduce noise level produced by transportation       Transmission of sound Source Discussion Transmission, Control of Noise Source by Discussion       Power point lecture, Group Discussion         12-15       8       • Compare between the concepts involved in noise control technologies       Source-Path-Receiver         12-15       8       • Compare between the concepts involved in noise control technologies       Source-Path-Receiver         20       • Compare between the concepts involved in noise control technologies       Source by Disgin, Noise Control of Noise Source by Redross, Protect the Receiver         11.       Course Evaluation       • Advise on methods of noise reduction and sound insulation for a range of situations       Power point lecture       Quiz         12.       Learning and Teaching Resources       Protect the Receiver       Power point lecture       Quiz         11.       Course Evaluation       Introduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5 <sup>th</sup> ed. (2013)       Introduction to Environmental Engineering "Chapter -				Effects on Performance,			
7-1110affecting noise propagation outdoor Apply wave in the description of sound propagation in the air Design road way barrier used to reduce noise level produced by transportationTransmission of sound outdoors Inverse Square Law, Radiation Fields of a Sound Source predictionPower point lecture, Group DiscussionH.W Assignments Quiz12-158• Compare between the concepts involved in noise control technologies • Advise on methods of nsise reduction and sound insulation for a range of situationsNoise control Source-Path-Receiver Concept, Control of Noise Source by Design, Noise Control of Noise Source by Design, Noise<			• Understand the factors	Noise Staildards			
outdoor • Apply wave in the description sound propagation in the air sound propagation in the air outdoors • Design road way barrier used to reduce noise level produced by transportationTransmission of sound outdoors Inverse Square Law, Radiation Fields of a Sound Source predictionPower point lecture, Group DiscussionH.W Assignments Quiz12-158• Compare between the concepts involved in noise control technologies • Advise on methods of noise reduction and sound insulation for a range of situationsNoise control Source-Path-Receiver Control of Noise Source by Design, Noise Control of Noise Source by Redress, Protect the ReceiverPower point lectureQuiz11.Course EvaluationVoise Source by Design, Noise Control of Noise Source by Redress, Protect the ReceiverPower point lectureQuiz4 quizzes10 pts10 pts2 homework4 pts Case study Report6 ptsTerm Exam Col pts60 pts7-11100 ptsIntroduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5% ed. (2013)Main references (sources)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)Hutps://www.fhwa.dot.gov/ENVIRonment/noise/			affecting noise propagation				
7-1110Apply characteristics of sound wave in the description of sound propagation in the air • Design road way barrier used to reduce noise level produced by transportationNoise control concept. DiscussionPower point lecture, Group DiscussionH.W Assignments Quiz12.158• Compare between the concepts involved in noise control technologies sound insulation for a range of situationsNoise control Source Path-Receiver Concept. Control of Noise Source by Design, Noise Power point lecturePower point lecture, Group DiscussionQuiz12.158• Compare between the concepts involved in noise control technologies source by Design, Noise Source by Design, Noise Control of Noise <br< td=""><td></td><td></td><td>outdoor</td><td>Transmission of sound</td><td></td><td></td></br<>			outdoor	Transmission of sound			
7-1110Contract ensues of a sound Sound propagation in the air • Design road way barrier used to reduce noise level produced by transportationRadiation Fields of a Sound Source Directivity, Airborne Transmission, Traffic noise predictionIf We point lecture, Group DiscussionAsignments Quiz12.158• Compare between the concepts involved in noise control technologies s Advise on methods of noise reduction and sound insulationsNoise control Source Path-Receiver Concept, Control of Noise Source by Design, Noise Control of Noise Source by Redress, Protect the ReceiverPower point lectureQuiz11.Course Evaluation• Advise on methods of noise reduction and sound insulationsNoise cource by Redress, Protect the ReceiverPower point lectureQuiz11.Course Evaluation• Advise on methods of noise reduction and sound insulationsIntroduction to Environmental Engineering "Chapter -10" Mackenzie Davis, 5th ed. (2013)Power point lectureQuiz12.Learning and Teaching Resources Total100 ptsIntroduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5th ed. (2013)Main references (sources)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)Mutps://www.fhwa.dot.gov/ENVIRonment/noise/Electronic References, Websiteshttps://www.fhwa.dot.gov/ENVIRonmen			Apply physical characteristics of sound	Inverse Square Law,	Power point	ЦW	
Sound propagation in the air Design road way barrier used to reduce noise level produced by transportationDiscussionDiscussionQuiz12-15A• Compare between the concepts involved in noise control technologies • Advise on methods of noise reduction and sound insulation for a range of situationsNoise control Source-Path-Receiver Concept, Control of Noise Source by Design, Noise Control in the Transmission Path, Control of Noise Source by Redress, Protect the ReceiverPower point lectureQuiz11.Course EvaluationSource-Path-Receiver Concept, Control of Noise Source by Design, Noise Control of Noise Source by Redress, Protect the ReceiverPower point lectureQuiz4 quizzes 2 homework10 pts 4 pts Case study Report fo pts10 ptsPower point lectureQuiz12.Learning and Teaching ResourcesIntroduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5th ed. (2013)Introduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5th ed. (2013)Main references (sources)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)User's guide traffic noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.Electronic References, Websiteshttps://www.fhwa.dot.gov/ENVIRonment/noise/	7-11	10	wave in the description of	Radiation Fields of a Sound	lecture, Group	Assignments	
12-15• Design road way barrier used to reduce noise level produced by transportationTransmission, Traffic noise predictionPower point lecture12-15• Compare between the concepts involved in noise control technologies • Advise on methods of noise reduction and sound insulation for a range of situationsNoise control Source-Path-Receiver Concept, Control of Noise Source by Design, Noise Control in the Transmission Path, Control of Noise Source by Redress, Protect the ReceiverPower point lectureQuiz4 quizzes 2 homework 4 pts Case study Report fotal10 ptsPower point Path, Control of Noise Source by Redress, Protect the ReceiverPower point lectureQuiz12.Learning and Teaching ResourcesIntroduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5th ed. (2013)Main references (scientific journals, reports)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)User's guide traffic noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.Electronic References, Websiteshttps://www.fhwa.dot.gov/ENVIRonment/noise/			sound propagation in the air	Directivity, Airborne	Discussion	Quiz	
used to reduce noise level produced by transportationPrediction12-158• Compare between the concepts involved in noise control technologies • Advise on methods of noise reduction and sound insulation for a range of situationsNoise control Source-Path-Receiver Concept, Control of Noise Source by Design, Noise Control of Noise Control of Noise Source by Design, Noise Control of Noise Source by Redress, Protect the ReceiverPower point lectureQuiz11.Course EvaluationVoise Source by Redress, Protect the ReceiverPower point lectureQuiz4 quizzes10 ptsSource of the ReceiverVoise Redress, Protect the ReceiverVoise Redress, Protect the Receiver12.Learning and Teaching ResourceIntroduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5th ed. (2013)Main references (sources)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)Engineering noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.Electronic References, Websiteshttps://www.fhwa.dot.gov/ENVIRonment/noise/			• Design road way barrier	Transmission, Traffic noise			
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12-158• Compare between the concepts involved in noise control technologies control technologiesNoise control of Noise control of Noise Source-Path-Receiver Source by Design, Noise Control in the Transmission Path, Control of Noise Source by Design, Noise Control in the Transmission Path, Control of Noise Source by Design, Noise Control in the Transmission Path, Control of Noise Source by Design, Noise Control in the Transmission Path, Control of Noise Source by Design, Noise Control in the Transmission Path, Control of Noise Source by Redress, Protect the ReceiverPower point lectureQuiz4 quizzes10 ptsControl of Noise Source by Redress, Protect the ReceiverSource-Path-ReceiverSource-Path-Receiver4 quizzes10 pts10 ptsSource-Path-ReceiverSource-Path-Receiver2 homework4 pts4 ptsCase study Report6 ptsTerm Exam20 ptsFinal Exam60 pts100 ptsIntroduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5 <sup>th</sup> ed. (2013)Main references (sources)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)Suer's guide traffic noise model 3.2, Federal Highway 			produced by transportation				
12-158Image of concepts involved in noise control technologies oncise reduction and sound insulation for a range of situationsConcept, Control of Noise Source by Design, Noise Control of Noise Source by Redress, Protect the ReceiverPower point lectureQuiz11.Course Evaluation4 quizzes10 ptsControl of Noise Source by Redress, Protect the ReceiverPower point lectureQuiz4 quizzes10 pts10 ptsSource by Design, NoiseFormer Source by Redress, Protect the ReceiverFormer Source by Redress, Protect the ReceiverFormer Source by Redress, Protect the Receiver11.Course Evaluation4 ptsSource by Design, NoiseSource by Redress, Protect the ReceiverPower point lecture12.Learning and Teaching ResourcesIntroduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5th ed. (2013)Source by Bies and Hansen, 4th ed. (2009)Required textbooks (curricular books, if any (scientific journals, reports)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recormended books and references (scientific journals, reports)Suide traffic noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.Electronic References, Websiteshttps://www.fhwa.dot.gov/ENVIRonment/noise/			Compare between the	Noise control Source-Path-Receiver			
12-158Control technologies Advise on methods of noise reduction and sound insulations for a range of 			concepts involved in noise	Concept, Control of Noise			
11. Course Evaluation       lecture       lecture       lecture         4 quizzes       10 pts       control of Noise Source by Redress, Protect the Receiver       lecture         4 quizzes       10 pts       statation of a range of situations       lecture       lecture         4 quizzes       10 pts       statation       lecture       lecture         11. Course Evaluation       4 pts       statation       lecture       lecture         4 quizzes       10 pts       statation       lecture       lecture         11. Course Evaluation       4 pts       statation       lecture       lecture         4 quizzes       10 pts       statation       lecture       lecture       lecture         12. Learning and Teaching Resources       statation to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5 <sup>th</sup> ed. (2013)       lengineering noise control, theory and practice by Bies and Hansen, 4 <sup>th</sup> ed. (2009)         Main references (sources)       Engineering noise control, theory and practice by Bies and Hansen, 4 <sup>th</sup> ed. (2009)       lecture       liser's guide traffic noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.         Electronic References, Websites       https://www.fhwa.dot.gov/ENVIRonment/noise/	12-15	8	<ul> <li>control technologies</li> <li>Advise on methods of</li> </ul>	Source by Design, Noise	Power point	Ouiz	
insulation for a range of situationsControl of Noise Source by Redress, Protect the Receiver11. Course Evaluation4 quizzes10 pts2 homework4 ptsCase study Report6 ptsTerm Exam20 ptsFinal Exam60 ptsTotal100 pts100 pts100 ptsIntroduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5 <sup>th</sup> ed. (2013)Required textbooks (curricular books, if any Main referencesMain referencesEngineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)User's guide traffic noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.Electronic References, Websiteshttps://www.fhwa.dot.gov/ENVIRonment/noise/	12 10	U	noise reduction and sound	Path,	lecture	Quiz	
Interferences       Structures       Protect the Receiver         Protect the Receiver       Protect the Receiver         11. Course Evaluation         4 quizzes       10 pts         2 homework       4 pts         Case study Report       6 pts         Term Exam       20 pts         Final Exam       60 pts         100 pts       100 pts         12. Learning and Teaching Resources         Required textbooks (curricular books, if any Mackenzie Davis, 5 <sup>th</sup> ed. (2013)         Main references (sources)       Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)         Recommended books and references (scientific journals, reports)       User's guide traffic noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.         Electronic References, Websites       https://www.fhwa.dot.gov/ENVIRonment/noise/			insulation for a range of situations	Control of Noise Source by Redress			
11. Course Evaluation4 quizzes10 pts2 homework4 pts2 homework4 ptsCase study Report6 ptsTerm Exam20 ptsFinal Exam60 ptsTotal100 pts12. Learning and Teaching ResourcesRequired textbooks (curricular books, if any Mackenzie Davis, 5th ed. (2013)Main references (sources)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)User's guide traffic noise model 3.2, Federal Highway 			situations	Protect the Receiver			
4 quizzes       10 pts         2 homework       4 pts         Case study Report       6 pts         Term Exam       20 pts         Final Exam       60 pts         Total       100 pts         12. Learning and Teaching Resources         Required textbooks (curricular books, if any         Introduction to Environmental Engineering "Chapter -10" by         Makenzie Davis, 5 <sup>th</sup> ed. (2013)         Main references (sources)         Recommended books and references         (scientific journals, reports)         Electronic References, Websites	11.	Course	e Evaluation				
2 homework4 ptsCase study Report6 ptsTerm Exam20 ptsFinal Exam60 ptsTotal100 pts12. Learning and Teaching ResourcesRequired textbooks (curricular books, if any Mackenzie Davis, 5th ed. (2013)Main references (sources)Introduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5th ed. (2013)Main references (sources)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)User's guide traffic noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.Electronic References, Websiteshttps://www.fhwa.dot.gov/ENVIRonment/noise/	4 quiz	zes	10 pts				
Case study Report6 ptsTerm Exam20 ptsFinal Exam60 ptsTotal100 pts12. Learning and Teaching ResourcesRequired textbooks (curricular books, if any Mackenzie Davis, 5th ed. (2013)Main references (sources)Introduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5th ed. (2013)Main references (sources)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)User's guide traffic noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.Electronic References, Websiteshttps://www.fhwa.dot.gov/ENVIRonment/noise/	2 hom	ework	4 pts				
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12. Learning and Teaching ResourcesRequired textbooks (curricular books, if any markenzie Davis, 5th ed. (2013)Introduction to Environmental Engineering "Chapter -10" by Mackenzie Davis, 5th ed. (2013)Main references (sources)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)User's guide traffic noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.Electronic References, Websiteshttps://www.fhwa.dot.gov/ENVIRonment/noise/	Total	-	100 pts				
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Mackenzie Davis, 5th ed. (2013)Main references (sources)Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)User's guide traffic noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.Electronic References, Websiteshttps://www.fhwa.dot.gov/ENVIRonment/noise/	Requir	ed textb	ooks (curricular books, if any	Introduction to Environmental	Engineering "Cha	apter -10" by	
Main references (sources)       Engineering noise control, theory and practice by Bies and Hansen, 4th ed. (2009)         Recommended books and references (scientific journals, reports)       User's guide traffic noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.         Electronic References, Websites       https://www.fhwa.dot.gov/ENVIRonment/noise/	Mackenzie Davis, 5 <sup>th</sup> ed. (2013)						
Hansen, 4th ed. (2009)Recommended books and references (scientific journals, reports)User's guide traffic noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.Electronic References, Websiteshttps://www.fhwa.dot.gov/ENVIRonment/noise/	Main references (sources)			Engineering noise control, the	eory and practice	by Bies and	
Recommended books and references       User's guide traffic noise model 3.2, Federal Highway Administration office of Natural Environment, 2023.         Electronic References, Websites       https://www.fhwa.dot.gov/ENVIRonment/noise/		Hansen, 4th ed. (2009)					
(scientific journals, reports)Administration office of Natural Environment, 2023.Electronic References, Websiteshttps://www.fhwa.dot.gov/ENVIRonment/noise/	Recom	nmended	l books and references	User's guide traffic noise	model 3.2, Fede	ral Highway	
Electronic References, Websites         https://www.fhwa.dot.gov/ENVIRonment/noise/	(scient	ific journ	als, reports)	Administration office of Natura	l Environment, 202	23.	
	Electro	onic Refe	erences, Websites	https://www.fhwa.dot.gov/l	ENVIRonment/no	oise/	

1. Course Name:					
Wastewater treatment plants design					
2. Course Code:					
ENV441					
3. Semester / Year:					
Spring/2024					
4. Description Preparation Date:					
February 2024					
5. Available Attendance Forms:					
In person lecture					
6. Number of Credit Hours (Total) / Number of Units (Total)	otal)				
4/4					
<ol><li>Course administrator's name (mention all, if more</li></ol>	e than one na	me)			
Name: Ammar Thamir Hamad					
Email: dr.ammarthamir@uomosul.edu.iq					
8. Course Objectives					
Course Objectives <ul> <li>Recognize the common physical, chemical and biological unit operations encountered in treatment processes (i)</li> <li>Apply the basic concepts of sciences and engineering to solve issues associated with the treatment of wastewater (i)</li> <li>Formulate a preliminary design of wastewater treatment plant including preliminary, primary, secondary, and tertiary treatment units (ii)</li> <li>Develop and solve design problems and analyze the data to evaluate the feasibility of a components of the wastewater treatment plant (ii).</li> <li>Report the data obtained from the site visits to WWTP that will be organized during the course (iv)</li> <li>Demonstrate the ability to lead and productively participate in group situations via assigning multidisciplinary design projects for specific wastewater unit processes (vii)</li> </ul>					
9. Teaching and Learning Strategies					
StrategyThis course has several components that include power point lectures, individual & group assignments, field visits and e-learning platforms. Exercises involving the use of computer applications tools to understand specific unit processes.					
10. Course Structure					
Week         Hours         Required Learning Outcomes         Unit or subject name	Learning method	Evaluation method			

1	4	Recognize the common physical, chemical and biological unit operations encountered in treatment processes	Introduction, objectives, general consideration of wastewater treatment plant planning and design	Power point lecture	Quiz	
2-3	8	Formulate a design of coarse screen and collection pit	Preliminary unit operation: Screening and collection pit	Power point lecture	Individual Assignments Quiz	
4	4	Formulate a design of grit chamber	Design of Grit chamber facilities	Power point lecture	Individual Assignments	
5	4	Formulate a design of PST	Primary unit operation (PST) Design	Power point lecture	Individual Assignments Quiz	
6-7	8	Recognize the common unit process of biological treatment	Fundamentals of biological treatment	Site visit	Report	
8-11	12	Formulate a design of activated sludge units	Design of suspended growth units: Activated sludge processes and modifications	Power point lecture	Individual Assignments Quiz	
12	4	Recognize the common features of trickling filter	Attached Growth systems: Trickling filter,	Power point lecture	Quiz	
13	4	Recognize the common features of Simplified Systems of waste water Treatment:	Simplified Systems of waste water Treatment: Aerated lagoons, Stabilization ponds	e-learning platforms	Quiz	
14-15	8	Formulate a design of grit chamber	Design of disinfection units: Chlorination, Ozonation, UV disinfection	Power point lecture	Group assignments	
11.	Cours	e Evaluation				
5 quizzes10 pts5 homework10 ptsTerm Exam20 ptsFinal Exam60 ptsTotal100 pts						
12.	Learn		CES	nginooring tr	optmont and	
Requir	ed textb	ooks (curricular books, if any	resource recovery", McGraw hill, New York, 2014			
Main references (sources)		es (sources)	S. Qasim and G. Zhu "Wastewater Treatment and Reuse Theory and Design Examples Volume 1: Principles and Basic Treatment", Taylor & Francis Group. 2018			
Recom	nmendeo	books and references	Karia, G.I. and Christian, R.A. "Wastewater treatment,			
(scient	tific jourr	nals, reports…)	Delhi, 2006.			
Electronic References, Websites			https://4enveng.com/			

1. Course Name:
Sustainable Environmental Engineering
2. Course Code:
ENG436
3. Semester / Year:
Fall / 2023-2024
4. Description Preparation Date:
15/02/2024
5. Available Attendance Forms:
In person and electronic (Google Classroom - lpxnyx7)
6. Number of Credit Hours (Total) / Number of Units (Total):
2/2
7. Course administrator's name (mention all, if more than one name):
Name: Dr. Omar M. Abdulkareem, Email: omaralhakeem@uomosul.edu.iq
Name: Taha A. Al-tayyar, Email: ta_tayyar@uomosul.edu.iq
8. Course Objectives:
<ul> <li>Course Objectives</li> <li>Learn about the principles, indicators and general concept of sustainability;</li> <li>Get a useful acquaintance about the features of sustainable concrete in accordance with the sustainable concept through identifying the ecological impacts of cement and concrete production,</li> <li>Apprehend the local, regional and global impacts of unsustainable designs, products and processes;</li> <li>Explore the types of new and renewable energies, and have indepth knowledge about the eutrophication;</li> <li>Your ability to use the mathematical and the scientific principles with the sustainability concepts in engineering.</li> </ul>
9. Teaching and Learning Strategies:
Strategy Power Point Presentations
10. Course Structure:

Week	Hours	Required	Unit or subject	Learning method	Evaluation
		Learning	name		method
		Outcomes	hanno		linetinet
		Learn about the	Sustainable		
		principles, indicators	development.		
1&2	4	and general concept	Conceptions,	Presentation	-
		of sustainability	Development &		
			applications		
		Explore the types of	Renewable Energy,		
		new and renewable	New and renewable		
		energies	Wind energy,		
3&4	4		Waterfalls energy,	Presentation	Quiz 1
			etc., Applications,		
			How to use		
		Have in-depth	Eutrophication in		
		knowledge about the	surface water, Types		
		eutrophication	of algae, causes, their		
5	2		quality treatment	Presentation	Report 1
5	2		plants, modeling of	rresentation	Report
			nutrients cycles		
		Get a useful	Sustainability of		
		acquaintance about	concrete:		
		the features of	Introduction,		
69.7	4	sustainable concrete	Negative		
0 0 1	4	the sustainable	of cement and		
		concept through	concrete industries.	Presentation	Quiz 2
		identifying the	Environmental		
		ecological impacts of	concerns, Ten		
		cement and concrete	qualifications of		
		production	concrete		
		Appropand the local	sustainability		
		regional and global	impacts of Portland		
		impacts of	cement production:		
		unsustainable	Introduction,		
		designs, products and	Description of cement		
		processes	production process,		
8&9	4		Main impacts,	Presentation	Report 2
			sustainability Social		
			sustainability, social		
			Economic		
			sustainability, Future		
			trends.		
		Able to use the	Environmental		
		the scientific	manufacture –		
10	2	principles with the	Mathematical	Presentation	Monthly Fxam
		sustainability	calculations		1
		concepts in			
		engineering			
		Get a useful	Sustainable ready mix		
		acquaintance about	plant-Case study:		

11	2	the features of sustainable concrete in accordance with the sustainable concept through identifying the ecological impacts of cement and concrete production	Introduction, Transportation of materials, Example of sustainable ready-mix plant, Conclusion.		Presentation	Quiz 3 + Report 3	
12 & 13	4	Get a useful acquaintance about the sustainable concept through identifying the ecological impacts of cement and concrete production	Noise control in the cement manufacture: Introduction, Sources of noise in cement works, Harm of noise in cement plant, Basic principles of noise control, Noise abatement in cement plant.		Presentation	Monthly Exam 2 + Report 4	
14 & 15	4	Get a useful acquaintance about the features of sustainable concrete	plant.Concretewithconstructionanddemolitionwastes(CWD):Introduction,Construction&demolitionwastesuses,Construction &demolitionwastessources,Construction& demolitionwastesclassification,ConstructionConstruction&demolitionwastescomposition,ConstructionConstruction&demolitionwastesmanagement,ConstructionConstruction&demolitionwastes		Presentation	Quiz 4	
			F	nal Exam			
11. Co	ourse Ev	valuation: x(16) + 2 Monthly	/ Fyam	$(14) \pm 4$	Penorts $(10) \perp Final$	$F_{xam}(60)$	
12.	Learnin	g and Teaching Re		es:	(10) + 1 mar		
Require	d textboo	bks (curricular books.	if any)	Non	e		
Main re	ferences	(sources)	57	• P-C,	Aïtcin and S	. Mindess,	
		× /		Sustain	ability of concret	e - Modern	
concrete techno					e technology ser	ies 17, 1st	
					edition, Spon Press, Taylor & Francis		
				Group,	2011.		
				• G. M.	Sabnis, Green b	uilding with	
				concret	e- Sustainable	design and	

	<ul> <li>construction, CRC Press, Taylor &amp; Francis Group, 2012.</li> <li>F. Pacheco-Torgal, S. Jalali, J. Labrincha and V. M. John, Ecoefficient concrete, Woodhead publishing limited, 2013.</li> <li>K. E. Peray, Cement manufacture's handbook, Chemical publishing Co., Inc., 1979.</li> <li>M. Davis and S. Masten, Principles of environmental engineering and science, McGraw-Hill, Inc., 2004.</li> </ul>
Recommended books and references	None
(scientific journals, reports)	
Electronic References, Websites	None

نموذج وصف المقرر

1. اسم المقرر:

هندسة البيئة المستدامة

2. رمز المقرر:

ENG436

3. الفصل / السنة:

الخريفي / 2024-2023

4. تاريخ إعداد هذا الوصف:

2024/02/15

أشكال الحضور المتاحة:

حضورياً والكترونيا (Google Classroom - lpxnyx7)

عدد الساعات الدر اسية (الكلي)/ عدد الوحدات (الكلي):

2/2

اسم مسؤول المقرر الدراسي ( اذا اكثر من اسم يذكر):

الأسم: د.عمر مجد عبدالكريم، الآيميل: omaralhakeem@uomosul.edu.iq

الاسم: طه أحمد الطيار ، الآيميل: ta\_tayyar@uomosul.edu.iq

8. اهداف المقرر:

التعرف على المبادئ والمؤشرات والمفهوم العام للاستدامة.	٠	اهداف المادة الدر اسية
التعرف بشكل مفيد على مميزات الخرسانة المستدامة وفق المفهوم المستدام من خلال التعرف	٠	
التأثيرات البيئية لإنتاج السمنت والخرسانة.		
فهم التأثيرات المحلية والإقليمية والعالمية للتصاميم والمنتجات والعمليات غير المستدامة.	٠	
استكشاف أنواع الطاقات الجديدة والمتجددة، والحصول على معرفة متعمقة حول التخثث.	٠	
قدرتك على استُخدام المبادئ الرياضية والعلمية مع مفاهيم الاستدامة في الهندسة.	٠	

9. استراتيجيات التعليم والتعلم:

عروض تقديمية بالPower Point

10. بنية المقرر:

الاستراتيجية

				33	** = *
طريقة التقييم	طريقة التعلم	اسم الوحدة او الموضوع	مخرجات التعلم المطلوبة	الساعات	الأسبوع
-	عرض تقديمي	التنمية المستدامة، مفاهيم، تطوير، تطبيقات	التعرف على المبادئ والمؤشرات والمفهوم العام للاستدامة	4	2 & 1
امتحان يومي 1	عرض تقديمي	الطاقة المتجددة: الطاقة الجديدة والمتجددة، طاقة الشمس، طاقة الرياح، طاقة الشلالات وغيرها، التطبيقات، كيفية الاستخدام	التعرف على أنواع الطاقات الجديدة والمتجددة	4	4 & 3
تقرير 1	عرض تقديمي	التخثث في المياه السطحية، أنهاع الطحالات، أسرادها،	معرفة متعمقة حول التخثث	2	5

						-		
		على نوعية المياه،	نتائجها					
		المعالجه، تمدجه الغذائية	محطات الدور ات					
امتحان يومي 2	عرض تقديمي	الخرسانة: مقدمة، بيئية السلبية لصناعات والخرسانة، ات البيئية، عشرة لاستدامة الخرسانة	ري الآثار ال السمنت الاهتمام مؤهلات	التعرف بشكل مفيد على مميزات الخرسانة المستدامة وفق المفهوم المستدام من خلال التعرف على التأثيرات البيئية لإنتاج السمنت والخرسانة	4	7&6		
تقرير 2	عرض تقديمي	ل البيئية لإنتاج السمنت لدي: مقدمة، وصف تتاج السمنت، التأثيرات له الاستدامة البيئية، له الاجتماعية، ت المستقبلية	التأثيرات البورتلان عملية إنا الرئيسية الاستدام الاستدامها	فهم التأثيرات المحلية والإقليمية والعالمية للتصاميم والمنتجات والعمليات غير المستدامة	4	8 9&		
امتحان شهري 1	عرض نقديمي	ن البيئية لصناعة - الحسابات الرياضية	التأثير ات السمنت	القدرة على استخدام المبادئ الرياضية والعلمية مع مفاهيم الاستدامة في الهندسة	2	10		
امتحان يومي 3 + تقرير 3	عرض تقديمي	الخرسانة الجاهزة - دراسة حالة: نقل المواد، مثال الخرسانة الجاهزة ، الاستنتاج	مصنع المستدام المقدمة، لمصنع المستدام	التعرف بشكل مفيد على مميزات الخرسانة المستدامة وفق المفهوم المستدام من خلال التعرف على التأثيرات البيئية لإنتاج السمنت والخرسانة	2	11		
امتحان شهري 2 + تقرير 4	عرض تقديمي	في الضوضاء في السمنت: مقدمة، الضوضاء في مصانع أضرار الضوضاء لنع السمنت، المبادئ اء، تقليل الضوضاء انع السمنت	التحكم صناعة مصادر السمنت، في مص الأساسية في مصا	احصل على معرفة مفيدة حول مفهوم الاستدامة من خلال التعرف على التأثيرات البيئية لإنتاج السمنت والخرسانة	4	12 13 &		
امتحان يومي 2	عرض تقديمي	ة مع مخلفات البناء مقدمة، استخدامات البناء والهدم، مصادر البناء والهدم، تركيب البناء والهدم، إدارة البناء والهدم، إعادة مخلفات البناء والهدم	لخرسان والهدم: مخلفات مخلفات مخلفات مخلفات استخدام	احصل على معرفة مفيدة حول ميزات الخرسانة المستدامة	4	14 15 &		
		ن نھائي	امتحار	1	ı	ı		
11. تقييم المقرر:								
4 امتحانات يومية (16) + 2 امتحانان شهريان (14) + 4 تقارير (10) + امتحان نهائي (60)								
12. مصادر التعلم والتدريس:								
الكتب المقررة المطلوبة ( المنهجية أن وجدت ) لا يوجد								
<ul> <li>P-C, Aïtcin and S. Mindess, Sustainability of concrete - Modern concrete, technology series, 17, 1st</li> </ul>								
concrete								

edition, Spon Press, Taylor &	
Francis Group, 2011.	
• G. M. Sabnis, Green building with	
concrete- Sustainable design and	
construction, CRC Press, Taylor &	
Francis Group, 2012.	
• F. Pacheco-Torgal, S. Jalali, J.	
Labrincha and V. M. John, Eco-	
efficient concrete, Woodhead	
publishing limited, 2013.	
• K. E. Peray, Cement manufacture's	
handbook, Chemical publishing Co.,	
Inc., 1979.	
• M. Davis and S. Masten, Principles	
of environmental engineering and	
science, McGraw-Hill, Inc., 2004.	
لا يوجد	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية،
	التقارير )
لا يوجد	المراجع الإلكترونية، مواقع الانترنيت

1. (	Course	e N	lame:						
Advan	Advanced Drinking Water Treatment								
2. (	2. Course Code:								
ENV49	ENV490								
3. \$	Semes	ter	/ Year:						
Spring/ 2023-2024									
4. ]	Descri	pti	on Preparation Dat	te:					
13-02-2	2024								
5. 4	Availa	ble	e Attendance Form	s:					
]	In Cla	SS							
6. I	Numb	er	of Credit Hours (Te	otal) /	Number of Un	nits (Total)			
	2 hour	s p	er week/ 2 units						
7. (	Course	e a	dministrator's name	e (mei	ntion all, if mo	re than one na	ame)		
I	Name:	M	lusab AbdulJabbar	Abdu	lBaki				
]	Email:	m	usabaltamir@uom	osul.e	du.iq				
8. (	Course	e C	bjectives						
Course	Objecti	ves			Learn son	ne specific and	advance methods		
					• Learn me	ig water treatme	nt reat the residuals		
					from drin	king water treat	ment plants.		
9. 7	Feachi	ing	and Learning Stra	tegies					
Strategy			The students	will b	e prepared to	achieve the	objectives by		
			class lectures	and, t	he evaluation	will take pla	ace with home		
			works, daily, te	ermly	and course exa	aminations.			
10. Co	ourse S	Str	ucture						
			Required	Un	it or subject	Learning	Evaluation		
Week	Hour	S	Learning	UI	name	method	method		
1.2			<u> </u>	Chemi	cal precipitation				
3-4	4		ii	Ion exe	change				
5-7	6		ii	Revers	e Osmosis		Home Works,		
8-9	4		ii	Electri	cal dialazes	Class	Quizzes,		
				Drinki	ng Water	Lectures	terms and		
10.15	10		::	Treatment plant residual Course course					
10-15	12		11	examinations					
11.Co	ourse I	Eva	aluation						
			Activity			Points			
	D	aily	v examinations			10			
	T	Η	ome works			5			
	Terms examinations 25								
Final examination 60									

12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Davis, M. L., (2010). "Water and wastewater engineering, design principles and practice", McGraw- Hill, Inc., 1300p.
Main references (sources)	Qasim, S. R, Motley, E. M. and Zhu, G., (2010). "Water works engineering planning, design and operation", Prentice Hall PTR.
Recommended books and references (scientific journals, reports)	Crittenden, J. C., Trussell, R. R., Hand, D. W., Howe, K. J., & Tchobanoglous, G. (2012). <i>MWH's water treatment: principles and</i> <i>design</i> . John Wiley & Sons.
Electronic References, Websites	

1. Co	1. Course Name: Estimation							
2. Co	ourse Co	ode: ENV448	8					
3 50	mostor	/ Voar: 2023	2 2021					
<u> </u>	mester	/ Teal. 202.	5-2024					
4. De	escripti	on Preparati	on Date:15-20-2024					
5. A	vailable	Attendance I	Forms: Class					
6. N	umber o	of Credit Hour	rs (Total) / Number of	Units (Total)				
2								
		dministrator	's name (mention all	if more than one	name)			
7. U	ame Dr	$\cdot$ Kaythar A	<u>s name (menuon all,</u> Ibrahim					
Er	nail: ka	vthar6871@	uomosul edu ia					
Na	ame: Av	vad Abdullah	uomobulicuuliq					
Er	nail: ay	ad_engineer	@uomosul.edu.iq					
8. Co	ourse O	bjectives	•					
Course Ol	piectives		Identifying the measure	ring units of the different typ	bes of			
	·,		quantities items.		ting of			
			Osing engineering for materials used in cons	truction.	ities of			
			Detect the estimated	prices of the construction pro-	ojects.			
9. Te	eaching	and Learning	y Strategies					
Strategy								
	This will	course has sev	eral components that inclu	de classes & lectures, e	xams. The cou			
	(VIII		bic.					
10. Cou	rse Stru	ucture						
Week	Hours	Required	Unit or subject name	Learning method	Evaluation			
		Learning			method			
		Outcomes						
1	2	i	Introduction to estimation	Power point+	Homework			
L L	2	I		whiteboard+				
	2		Aroos & Volumes	discussion Power point	Ouiz			
	2 2 ii Areas & Volumes, Power point+ Quiz Detailed Estimation & whiteboard+							
			Rough Estimation.	discussion				
10. Course StructureWeekHoursRequired Learning OutcomesUnit or subject name MethodLearning method methodEvaluation method12iIntroduction to estimation Power point+ discussionPower point+ whiteboard+ discussionHomework22iiAreas & Volumes, Potailed Estimation & Rough Estimation.Power point+ whiteboard+ discussionQuiz								

			a 11 F		<b>D</b>	-
3&4	4	ii	Soil Excavation		Power point+	Exam
					discussion	
58.6	1.	i±ii	Measuring of concrete		Power point+	Homework
500	т	1 ' 11	volume &	composition	whiteboard+	
			according	to mix design	discussion	
7&8	4	ii	Measuring	of blockwork	Power point+	Quiz
			& stonewo	rk.	whiteboard+	
				1 1	discussion	
9&10	4	ii	Quantities	calculation of	Power point+	Homework
			concrete re	inforcement	discussion	
11	2		Mid-term e	exam		
11	2		Measuring	of construction	Power noint+	Ouiz
12	Z	1+11	finishing	or construction	whiteboard+	Quiz
			0		discussion	
13	2	i+ii	Pricing and	d Cost	Power point+	Exam
			Analysis:		whiteboard+	
					discussion	<b>P</b>
14	2	i	Bill of qua	ntity	Power point+	Exam
					discussion	
15	2	i	Contract Specification &		Power point+	Exam
15	4	1	Conditions		whiteboard+	
					discussion	
11. Cour	se Evalua	ition				
Distribut	ing the so	core out of 100	according	to the tasks as	signed to the student s	such as daily
preparati	on, daily	oral, monthly,	, or written	exams, report	s etc	
Homewo	rks: 20 n	narks				
Quizzes:	o marks	<b>S</b>				
Exams. J	0 11101 KS					
12. Le	earning	and Teaching	g Resource	es		
Required	textbooks	s (curricular boo	oks, if any)			
Main references (sources)			B. N. Dutta, "Estimation and Costing in Civil			
		Engineering- Theory and Practice" Twenty-Eight				
			Revised Edition	n, UBS Publishers, IND	IA, 2012.	
Recommended books and references			references	Martin Brook, "Estimating and Tendering for		
(scientific journals, reports)				Construction 2004.	Work ", ELSEVIER, T	hird Edition,
Electronic References, Websites						