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

2024

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:

Academic Program Description: 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.

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

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

Program Objectives: 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.

Teaching and learning strategies: 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:

Date:

Signature:

Scientific Associate Name:

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 Courses	Credit hours	Percentage	Reviews*
Institution Requirements	12	23	13.7	
College Requirements	12	25	14.9	
Department Requirements	43	120	71.4	
Summer Training	1	….		
Other				

7. Program Description

Year/ Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
1	ENV111	Mathematics	3	
	ENV112	Statics	3	
	ENV113	Engineering Drawing	3	3
	ENV114	Environmental Thermodynamics	3	
	ENV115	Statistics	2	
	UOM101	Arabic	2	
	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 1	2	
2	UOMC	English language pre-intermediate	2	
	ENGC227	Statistics	2	
	ENV240	Engineering mathematics	4	
	ENV241	Engineering surveying	4	3
	ENV242	Principles of environmental engineering	2	
	ENV243	Strength of materials	3	
	ENV244	Construction materials	1	2
	ENV245	Remote sensing	2	
	UOMC	Electrical 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
3	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	
	ENV345	Engineering research	2	
	UOMC	English language - intermediate	2	
	ENV346	Sanitary Sewer networks	3	
	ENV347	Foundation engineering	3	
	ENV348	Water chemistry	3	
	ENV349	Reinforcement concrete	3	
	ENV350	Solid waste	4	
	ENV390	Noise pollution	2	
4	ENG425	Engineering management	2	
	ENG436	Sustainable environmental engineering	2	
	ENV440	Drinking water treatment	4	
	ENV441	Wastewater 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	
Learning Outcomes (**A**)	**A1**-An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics. **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. **A4**-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	
Learning Outcomes (**B**)	**B1**-An ability to develop and conduct appropriate experimentation, analyze and interpret data **B2**-An ability to using engineering judgment to draw conclusions **B3**-An ability to skillfully communicate orally with a gathering of people and in writing with various managerial levels. **B4**-An ability to perceive the continual necessity for professional knowledge growth and how to find, assess, assemble and apply it properly.
Ethics	
Learning Outcomes (**C**)	**C1**-An ability to recognize ethical and professional responsibilities in engineering situations **C2**-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 **C4**-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

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		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 Engineering	Environmental Engineering			9	
Lecturer	Civil Engineering	Structural Engineering			5	
Lecturer	Civil Engineering	Geotechnique			1	
Assist. Lecturer	Civil Engineering	Environmental Engineering			5	
Assist. Lecturer	Civil Engineering	Structural Engineering			1	
Assist. Lecturer	Computer 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
- ✓ 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															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
1	ENV111	Mathematics	Basic	*		*									
	ENV112	Statics	Basic	*		*									
	ENV113	Engineering Drawing	Basic	*		*		*			*				
	ENV114	Environmental Thermodynamics	Basic	*		*									
	ENV115	Statistics	Basic	*		*									
	UOM101	Arabic	Basic	*		*				*					
	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							*	*				
2	UOMC	English language pre-intermediate	Basic							*	*				
	ENGC227	Statistics	Basic	*		*									
	ENV240	Engineering mathematics	Basic	*		*									
	ENV241	Engineering surveying	Basic	*		*		*							
	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	*		*									
3	ENG329	Public safety	Basic	*						*					*
	ENG320	Numerical analysis	Optional	*		*									
	ENV340	Water supply networks	Basic	*	*	*									
	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	*	*	*	*								
4	ENG425	Engineering management	Basic	*		*				*	*	*	*	*	*
	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 الدراسية					
Module Title	Mathematic			**Module Delivery**	
Module Type	Support or related learning activity			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENV111				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		1	**Semester of Delivery**		1
Administering Department		ENV8	**College**	ENG4	
Module Leader	Mayada Hazim		**e-mail**	mayada.hmah@uomosul.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.Sc.
Module Tutor	Abeer Khalil Ibrahim		**e-mail**	abeer.alsaraf@uomosul.edu.iq	
Peer Reviewer Name		Mayada Hazim	**e-mail**	mayada.hmah@uomosul.edu.iq	
Scientific Committee Approval Date		7/11/2023	**Version Number**	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 الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	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
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. **CLO-1:** Recognize fundamentals of math and the emphasis on functions and graphs(i). **CLO-2:** understanding various limit problems both algebraically and graphically and using it by checking the continuity of various types of functions(i). **CLO-3:** Finding the derivative of various types of functions using the differentiation rules (i). **CLO-4:** Appling differentiation to find linear approximation and optimization problems(ii) **CLO-5:**solve matrices and operations on matrices and using matrices in solving linear equations(i).
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Prerequisites for calculus Coordinates and Graphs in the Plane, Slope and Equations for Lines, Functions and Their Graphs, Shifts, Circles and Parabolas, A Review of Trigonometric Functions (17 hrs). Part B – Limits and Continuity Limits**,** The Sandwich Theorem and (sin θ)/θ**,** Limits Involving Infinity, Continuous Functions**.** (10 hrs). Part C – Derivatives Slope, 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, Linear Approximations and Differentials (17 hrs). Part D - Applications of Derivatives Related Rates of Change, Maximal, Minima and the Mean Value Theorem, Curve Sketching with y', y'' , Graphing Rational Functions-Asymptotes and Dominant 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 استراتيجيات التعلم والتعليم	
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) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي 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 الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation تقييم المادة الدراسية					
		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	2% (2)	6	CLO-1, CLO-2.
	Onsite Assignment	5	2% (10)	3, 6, 9, 12 and 15	CLO-1, CLO-2, CLO-3, CLO-4, CLO-5.
	Projects / Lab.	0	0	0	
	Report	1	3% (3)	12	CLO-1, CLO-2, CLO-3,

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي 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	• 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/	

Grading Scheme
مخطط الدرجات

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

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

Course Description Form

1. Course Name:
Engineering Drawing
2. Course Code:
ENGC124
3. Semester / Year:
2023-2024 / Fall semester
4. Description Preparation Date:
1/10/2023
5. Available Attendance Forms:
attending
6. Number of Credit Hours (Total) / Number of Units (Total)
45 hour/ 1 unit
7. Course administrator's name (mention all, if more than one name)
Name: Aymen Waleed Naeif Email: aymanwaleed1975@uomosul.edu.iq Name: mohammed husham shukur Email: m.h.alkafaf@uomosul.edu.iq
8. Course Objectives

Course Objectives	• use the technical drawing tools properly and to plot pictures according to the dimensions and properties of technical drawing • using scale, types of scales and measurement techniques to drawings. • Increasing the students ability to imagine • carrying out the perspective drawings due to views.

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. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

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

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. Course Name:
Statistics
2. Course Code:
ENV314
3. Semester / Year:
First/ 2023-2024
4. Description Preparation Date:
1/10/2023
5. Available Attendance Forms:
In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week/ total units 2
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Abdulmuhsin Sadullah Shihab Email: mss_qzz@uomosul.edu.iq
8. Course Objectives

Course Objectives	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. Teaching and Learning Strategies	
Strategy	Learning and teaching 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 exams and homework with one or more semester exams and then the final exam.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	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. Course Name: physics	
14. Course Code: ENGE 133	
15. Semester / Year: Spring Semester 2023−2024	
16. Description Preparation Date: 13/2/2024	
17.Available Attendance Forms : Attendance in person	
18.Number of Credit Hours (Total) / Number of Units (Total) (2 /week) /(2)units	
19. Course administrator's name (mention all, if more than one name)	
Name: ayad Abdullah mousa Email: ayad_engineer.uomosul.edu.iq	
20. Course Objectives	
Course Objectives	• **prepare the student and equipped him with the basic knowledge to c with different subjects in different study levels.** • **utilizing Math and the basic knowledge in Physics to solve differ problems in Engineering**

21.	Teaching and Learning Strategies
Strategy	In person lectures. The lectures are delivered using data show. learning is also used to deliver the homework's and handouts.

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1/2	4	Unites and measurements	The objective the Physics cou is to generate fundamental knowledge skills needed the engineer study in various departments of engineering college; that t all basic governed in way or over physics la There's no v you would so complex engineering	Lectures	Quizzes Homework Monthly exa Final exam
3/4	4	Kinematics			
5/6	4	Energy			
7/8/9	6	Momentum and universal gravitatio			
10/11/12	6	Fluid Mechanics			

13/14/15	6	Thermos dynamic	problems with understanding physics behind So the cou aimed to prep the student to advance engineering courses.		

23. Course Evaluation

10 marks (Quizzes)

20 mark (monthly exam)

5 mark (home work)

5 mark (preparation)

60 mark (final exam)

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. Physics for scientists and engineers: An interactive approach. Robert Hawkes, Javed Iqbal, Firas Mansour, Marina Milner-Bolotin and Peter Williams. 2nd edition, 2019. 2. Physics for Scientists and Engineers with modern physics. Raymond A. Serway and John W. Jewett. 9thedition, 2014.3 3. Fundamentals of physics. David Halliday, Robert Resnick and Jearl Walker.10thEdition, 2014. 4. Engineering Mechanics: Dynamics - Volume 2. J.L. Meriam, L.G. Kraige and J. N. Bolton. 8thedition, 2015.
Recommended books and references (scientific	

journals, reports…)	
Electronic References, Websites	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Environmental Geology			**Module Delivery**	
Module Type	Supported			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐**Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	ENV124				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level	1		**Semester of 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 Leader'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 Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This 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.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. **CLO-1:** The students will learn and take some information on the principles of geology, especially the materials, and compounds of the earth. (i) **CLO-2:**The students will be able to distinguish the different types of rocks and soils(ii) **CLO-3:** apply the principles of the contour line to draw topographic maps (ii) **CLO-4:** 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) **CLO-5:** Report the data obtained from the selective topics of environmental geology given and organized during the course (iv) **CLO-6:** Creating some opinions about the emerging environmental issues and trying to give some solutions compatible with the problems related to environmental geology (vii)

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A Introduction</u> 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) <u>Part C – Geology of water</u> Geology of water supply, (part1) Surface Water, (part2) Ground Water Geology of dams and reservoirs (8 hrs) <u>Part D – materials and maps geology</u> 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 الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	30 % (30)	3, 6, 9	CLO-1, CLO-1, CLO-2, CLO-4
	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 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	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-engineering-dept/	

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

Module Information معلومات المادة الدراسية					
Module Title	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 of 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 Leader'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 Number**	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This 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.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. **CLO-1:** The students will learn and take some information on the principles of geology, especially the materials, and compounds of the earth. (i) **CLO-2:**The students will be able to distinguish the different types of rocks and soils(ii) **CLO-3:** apply the principles of the contour line to draw topographic maps (ii) **CLO-4:** 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) **CLO-5:** Report the data obtained from the selective topics of environmental geology given and organized during the course (iv) **CLO-6:** Creating some opinions about the emerging environmental issues and trying to give some solutions compatible with the problems related to environmental geology (vii)
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A Introduction</u> 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) <u>Part C – Geology of water</u> Geology of water supply, (part1) Surface Water, (part2) Ground Water Geology of dams and reservoirs (8 hrs) <u>Part D – materials and maps geology</u> 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 الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	3	30 % (30)	3, 6, 9	CLO-1, CLO-1, CLO-2, CLO-4
	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 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	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-engineering-dept/	

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

Module Information معلومات المادة الدراسية					
Module Title	Calculus			**Module Delivery**	
Module Type	Support or related learning activity			☒ **Theory**	
Module Code	ENV121			☐ **Lecture**	
ECTS Credits	6			☐ **Lab**	
SWL (hr/sem)	150			☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level		1	**Semester of Delivery**		2
Administering Department		ENV8	**College**	ENG4	
Module Leader	Mayada Hazim		**e-mail**	mayada.hmah@uomosul.edu.iq	

Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor	Abeer Khalil Ibrahim Aya Thamer Ibrahim	**e-mail**	abeer.alsaraf@uomosul.edu.iq aya.thamer@uomosul.edu.iq
Peer Reviewer Name	Mayada Hazim	**e-mail**	mayada.hmah@uomosul.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**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	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
Module Learning Outcomes	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.

مخرجات التعلم للمادة الدراسية	**CLO-1:** Recognize indefinite integrals and definite integral and know the basic properties(i). **CLO-2:** Use applications of definite integral to find areas between curves, volumes, lengths of plane curves and areas of surfaces of revolution(ii). **CLO-3:** Identified and understand of transcendental functions and know the basic properties(i). **CLO-4:** Applied techniques of integration to change unfamiliar integrals into integrals we can recognize and solve(i). **CLO-5:** Identified and understand of Polar Coordinates and know the basic properties(i).
Indicative Contents المحتويات الإرشادية	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 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^x , 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).

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies الاستراتيجيات	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)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي 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 الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation

تقييم المادة الدراسية

	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 assessment	**Midterm Exam**	2hrs	10% (10)	9	CLO-1, CLO -2, CLO -3,
	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 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 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	• Anton, H., Bivens, I.C., Davis, S., Calculus: Early	Yes

Texts	Transcendentals, Wiley, 10th edition, 2011.	
Websites	https://uomosul.edu.iq/en/engineering/environmental-engineering-dept/	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Calculus	**Module Delivery**
Module Type	Support or related learning activity	☒ **Theory**
Module Code	ENV121	☐ **Lecture**
ECTS Credits	6	☐ **Lab**
SWL (hr/sem)	150	☒ **Tutorial**
		☐ **Practical**

		☐ **Seminar**	
Module Level	1	**Semester of Delivery**	2
Administering Department	ENV8	**College**	ENG4
Module Leader	Mayada Hazim	**e-mail**	mayada.hmah@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor	Abeer Khalil Ibrahim Aya Thamer Ibrahim	**e-mail**	abeer.alsaraf@uomosul.edu.iq aya.thamer@uomosul.edu.iq
Peer Reviewer Name	Mayada Hazim	**e-mail**	mayada.hmah@uomosul.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**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	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
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. **CLO-1:** Recognize indefinite integrals and definite integral and know the basic properties(i). **CLO-2:** Use applications of definite integral to find areas between curves, volumes, lengths of plane curves and areas of surfaces of revolution(ii). **CLO-3:** Identified and understand of transcendental functions and know the basic properties(i). **CLO-4:** Applied techniques of integration to change unfamiliar integrals into integrals we can recognize and solve(i). **CLO-5:** Identified and understand of Polar Coordinates and know the basic properties(i).
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Integration</u> 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). <u>Part B –Applications of Definite Integrals</u> 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). <u>Part C –The Calculus of Transcendental Function</u> Inverse Function and Their Derivatives, Ln x ,e^x , 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). <u>Part D - Techniques of Integration</u>

	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).
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies الاستراتيجيات	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)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي 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 الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation

تقييم المادة الدراسية					
		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 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 assessment	**Midterm Exam**	2hrs	10% (10)	9	CLO-1, CLO -2, CLO -3,
	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 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 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	• 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/	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	ثرموداينامیك وانتقال الحرارة	**Module Delivery**	
Module Type	دأعم	• ☒ **Theory** • ☒ **Lecture** • ☒ **Lab** • ☒ **Tutorial** • ☐ **Practical** • ☐ **Seminar**	
Module Code	ENV114		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	**Semester of Delivery**	1

Administering Department	ENV8		**College**	ENG4	
Module Leader	Maan S. Mohammed		**e-mail**	maandabbagh@uomosul.edu.iq	
Module Leader's Acad. Title	Ass. Professor		**Module Leader's Qualification**	M.Sc	
Module Tutor	Maan S. Mohammed		**e-mail**	maandabbagh@uomosul.edu.iq	
Peer Reviewer Name	Maan S.Mohammed		**e-mail**	maandabbagh@uomosul.edu.iq	
Scientific Committee Approval Date	07/11/2023		**Version Number**	1.0	

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	N/A	**Semester**	
Co-requisites module	N/A	**Semester**	

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

Module Aims
أهداف المادة الدراسية

سيكون الطلاب قادرين على:

1- 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 قياس درجة الحرارة والضغط بأجهزة القياس التقليدية والحديثة.
5- تمكين الطالب من معرفة أنواع الطاقة وتطبيقاتها.
6- تطوير المبادئ والقوانين الأساسية للثرموداينامیك واستكشاف آثار هذه المبادئ على سلوك النظام بما في ذلك:
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 الحقيقي.
10- تحليل وتصميم أنظمة نقل الحرارة من خلال تطبيق هذه المبادئ.
11- استخدم الرسوم البيانية والرسوم البيانية لتوصيل النتائج.
12- تطوير مهارات حل المشكلات الأساسية للممارسة الهندسية الجيدة لنقل الحرارة في تطبيقات العالم الحقيقي.
13- اقرار الاستراتيجيات التي سيتم استخدامها والافتراضات التي يجب وضعها.

Module Learning Outcomes
مخرجات التعلم للمادة الدراسية

اكتب على الأقل 6 مخرجات تعليمية، ومن الأفضل أن تكون مساوية لعدد أسابيع الدراسة:
الهدف رقم 1: دراسة بعض المفاهيم والتعاريف وأنواع الأنظمة.
الهدف رقم 2: قياس الضغط ودرجة الحرارة ومعرفة وشرح مبدأ عمل الأجهزة من درجة الحرارة والضغط
الهدف رقم 3: دراسة المفاهيم الأساسية للديناميكا الحرارية.
الهدف رقم 4: تطوير قدرة مرنة وإبداعية على حل المشكلات وترجمة الأوصاف الفيزيائية إلى معادلات رياضية.
الهدف رقم 5: فحص النتائج المتوسطة أو الكميات الأخرى التي يمكن استخدامها لضمان التوصل إلى حل.
الهدف رقم 6: تحديد ما لا يفهمونه وطرح أسئلة محددة لاكتساب الفهم وتطوير قدرتهم على إيصال الأفكار العلمية.
الهدف رقم 7: تمكين الطلاب من استخدام برامج البحث على الإنترنت للاستفادة من المصادر، وتمكين الطالب من
إعداد التقارير اليومية الخاصة بالديناميكا الحرارية وإعداد كتيبات تتناول التأثيرات الحرارية على البيئة.
الهدف رقم 8: تمكين الطالب من العمل في المراكز البحثية والمؤسسات الصناعية.
الهدف رقم 9: فهم وتطبيق الفكرة الأساسية لنظرية انتقال الحرارة على الأنظمة الفيزيائية.
الهدف رقم 10: دراسة أنواع الطاقة وتطبيقاتها.
الهدف رقم 11: دراسة الفرق بين الأنظمة المغلقة والمفتوحة، وشرح النماذج الرياضية للأنظمة الفيزيائية وتحديد ووصف مبدأ الحالة المستقرة
الهدف رقم 12: طريقة انتقال الحرارة.
الهدف رقم 13: القدرة على تحديد المشكلات الهندسية المعقدة وتحليلها وحلها وفقًا لمبادئ الهندسة والعلوم والرياضيات.
الهدف رقم 14: القدرة على اكتساب وتطبيق المعرفة الجديدة واستخدام استراتيجيات التعلم المناسبة.
الهدف رقم 15: القدرة على المشاركة والعمل بشكل احترافي وأخلاقي في مشاريع مختلفة للعمل ضمن فرق متعددة

	التخصصات.
Indicative Contents **المحتويات الإرشادية**	يتضمن المحتوى الإرشادي ما يلي. ❖ الكميات الأساسية، ويشمل: [10 ساعات] - النظام الدولي للوحدات وكتابة الوحدات ومختصراتها بشكل صحيح - تنمية قدرة الطالب على فهم الأجسام الديناميكية الحرارية. - التعرف على أنواع الطاقة وتطبيقاتها. - معرفة الفرق بين انتقال الحرارة والشغل. - كيف يمكن حساب الحرارة المفقودة والمكتسبة من أو عن طريق النظام. - كيف يمكن حساب الطاقة من أو عن طريق النظام. - تمييز انتقال الحرارة في النظام المغلق. - تميز العمل في النظام المغلق. ❖ أنواع الطاقة وتطبيقاتها: [10 ساعات] - ذكر وشرح وتطبيق الفرق بين ضغط المقياس. - التفريق بين الضغط للمواد الصلبة والسائلة والغازية. - كيف يمكن حساب ونقل الوحدات. - حل المشاكل ❖ قانون الغاز المثالي [10 ساعات] - ما هو الغاز المثالي (الغاز المثالي) - دراسة قانون الغاز العام. - سلوك العديد من ثابت الغاز وقانون بويل وقانون تشارلز وقانون جاي لوساك. ❖ القانون الأول للديناميكا الحرارية وتطبيقاته: [10 ساعات] - من أجل التعامل مع موضوع الديناميكا الحرارية التطبيقية بدقة من الضروري معرفة الفرق بين التطبيقات. - حالة سائل العمل. - دراسة معادلة عدم التدفق. - دراسة معادلة التدفق الثابت. - الفرق بين النظام المغلق والنظام المفتوح وتطبيقهما ❖ انتقال الحرارة: [5 ساعات] - انتقال الحرارة بالتوصيل. - انتقال الحرارة بالحمل الحراري. - انتقال الحرارة بالإشعاع.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies الاستراتيجيات	ستكون الإستراتيجية الأساسية لتقديم هذه الوحدة هي تشجيع الطلاب على المشاركة في التمارين مع تحسين وتوسيع مهارات التفكير النقدي لديهم. وسيتم تحقيق ذلك من خلال الفصول الدراسية والبرامج التعليمية التفاعلية والنظر في التجارب البسيطة التي تتضمن أنشطة أخذ العينات التي يجدها الطلاب مثيرة للاهتمام.

Student Workload (SWL)
الحمل الدراسي للطالب

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

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	4% (20)	4,6,9,11, and 15	الاهداف 1,2,10,11, and 12
	Assignments	4	2% (8)	5,7,10,12	الاهداف 1,2,11, and 12
	On-site Assignments	2	2% (4)	3,8	الاهداف 10, and 12
	Reports	2	4% (8)	5, and 13	الاهداف 1,2,10,11, and 12
Summative assessment	Midterm Exam	2hrs	10% (10)	7	الاهداف 1,2,3,4,5,6,7,8,9,10,11, and 12
	Final Exam	3hrs	50% (50)	16	جميع الاهداف
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	المقدمة والأبعاد والوحدة. بعض المفاهيم والتعاريف وأنواع الأنظمة.
Week 2	قياس الضغط ودرجة الحرارة
Week 3	قوانين الغاز المثالية
Week 4	ورقة المسائل المحلولة رقم 1 الواجب المنزلي 1 اختبار
Week 5	أشكال الطاقة
Week 6	ورقة المسائل المحلولة رقم 2 الواجب المنزلي 2 اختبار
Week 7	امتحان نصف الفصل
Week 8	قوانين الديناميكا الحرارية / القانون الأول للديناميكا الحرارية العمليات الديناميكية الحرارية - تطبق على عملية النظام المغلق
Week 9	ورقة المسائل المحلولة رقم 3 الواجب المنزلي 3 اختبار
Week 10	العمليات الديناميكية الحرارية - مطبقة على عملية النظام المفتوح
Week 11	ورقة المسائل المحلولة رقم 4 الواجب المنزلي 4 اختبار
Week 12	طرق انتقال الحرارة
Week 13	التطبيق البيئي لنقل الحرارة
Week 14	العمليات متساوية الحرارة وغير متساوية الحرارة
Week 15	ورقة المسائل المحلولة رقم 5 الواجب المنزلي 5 اختبار
Week 16	الامتحان النهائي للفصل الدراسي

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Applied thermodynamics fifth edition by t.d eastop and a. mcconkey	Yes
Recommended Texts	Y. A. Çengel and M. A. Boles, Thermodynamics: An Engineering Approach, 5th ed, McGraw-Hill, 2006	No
Websites	https://uomosul.edu.iq/en/engineering/environmental-engineering-dept/	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success	A - Excellent	امتياز	90 - 100	أداء مذهل.

Group (50 - 100)				
	B - Very Good	**جيد جدا**	80 - 89	فوق المتوسط مع بعض الأخطاء.
	C - Good	**جيد**	70 - 79	عمل سليم مع وجود أخطاء ملحوظة.
	D - Satisfactory	**متوسط**	60 - 69	متوسط ولكن مع عيوب كبيرة.
	E - Sufficient	**مقبول**	50 - 59	العمل يلبي الحد الأدنى من المعايير.
Fail Group (0 – 49)	**FX –** Fail	**راسب (قيد المعالجة)**	(45-49)	مطلوب المزيد من العمل، ولكن يتم منح الائتمان.
	F – Fail	**راسب**	(0-44)	مطلوب قدر كبير من العمل.

ملاحظة: سيتم تقريب العلامات العشرية التي تزيد أو تقل عن 0.5 إلى العلامة الكاملة الأعلى أو الأدنى (على سبيل المثال، سيتم تقريب علامة 54.5 إلى 55، في حين سيتم تقريب علامة 54.4 إلى 54. لدى الجامعة سياسة عدم التغاضي عن "فشل التمريرة القريبة" وبالتالي فإن التعديل الوحيد للعلامات الممنوحة بواسطة العلامة (العلامات) الأصلية سيكون التقريب التلقائي الموضح أعلاه.

Course Description Form

1. Course Name:
2. Course Code:
ENV242
3. Semester / Year:
Autumn Semester/2023-2024
4. Description Preparation Date:
2023-2024
5. Available Attendance Forms:
Incide the class, online
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: Hanan Haqi Thura Azzam Email: hanan.eng2014@uomosul.edu.iq Thura.azzam@uomosul.edu.iq
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. Teaching and Learning Strategies	
Strategy	The strategy is achieved through lectures, e-learning platforms, and giving home and class assignments.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
2	4	Get a general idea about the concept of environmental engineering and learn about Physical	Introduction. What's the	PowerPoint lecture	Daily exam
1	2	and chemical properties of water.	environmental engineering. Duties	PowerPoint lecture	Daily exam a
1	2	Identify the most important surface water pollutants and	of Environmental	PowerPoint lecture	Homework
2	4	their requirements Biochemic oxygen.	Engineer. water: chemical	PowerPoint lecture	Homework
2	4	Applying the principle of mass balance to some common environmental problems.	and physical properties of water.	PowerPoint lecture	Daily exam
1	2	Knowledge of the phenomeno of nutrient enrichment in	Definition for solids found in	PowerPoint lecture	Daily exam
2	4	lakes and the phenomenon of thermal stratification.	water & wastewater.	PowerPoint lecture	Daily exam and Homework
2	4	Determine the units of both drinking water treatment	Classification of size range of	Electroni lecture	Class assignment
1	2	plants and treatment plants Waste water.	particles found in water.	Electroni lecture	
1	2	Knowledge of the sources a characteristics of solid waste, methods of disposal so	Water	discussio	a repor

		waste. Identify noise pollution, harms, and ways to combat it. Identify the most common typ of pollution in the environme such as air pollution. Knowledge of thermal polluti its sources, and ways to redu its impact on Waterbodies. Identify radioacti contamination and ways prevent it.	quality. Surface water pollution and its sources, The EPA Beneficial Uses of Surface Water, Biochemical Oxygen Demand. Mass Balance Approach To Solve Environmental Problems steady – State condition – Conservative. Water quality in lakes. Lakes characteristics ,Factors Controlling The		a repor a repor

			Eutrophication ,Thermal Stratification ,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 characteri		

			stics of Solid Waste, Solid Waste disposal methods. Noise pollution, noise meter, calculatio n of noise from different sources. air pollution . sources of air pollution .practical removal methods. thermal pollution : Sources of the thermal pollution. Radioacti ve pollution.		

11.Course Evaluation
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 Resources

Required textbooks (curricular books, if any)	Tariq Ahmed Mahmoud "Environmental Technolo 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 Preparation Date:
2023-2024
17.Available Attendance Forms:
Incide the class, online
18.Number of Credit Hours (Total) / Number of Units (Total)
2/2
19. Course administrator's name (mention all, if more than one name)
Name: Hanan Haqi Thura Azzam Email: hanan.eng2014@uomosul.edu.iq Thura.azzam@uomosul.edu.iq

20.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.
21.Teaching and Learning Strategies	

Strategy	The strategy is achieved through lectures, e-learning platforms, and giving home and class assignments.

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
2	4	Get a general id about the concept environmental engineering and lea	Introduction. What's the environmental engineering. Duties of Environmental Engineer. water: chemical and physical properties of water. Definition for solids found in water & wastewater. Classification of size range of particles found in water. Water quality. Surface water pollution and its sources, The EPA Beneficial Uses of Surface Water, Biochemical Oxygen Demand. Mass Balance Approach To Solve Environmental Problems steady –State condition – Conservative.	Power int lecture	Daily exar
1	2	about Physical a chemical properties of water		Power int lecture	Daily exa and Homewor
1	2	Identify the m important surfa water pollutants an		Power int	Homewor
2	4	their requiremer Biochemical oxyger		lecture	Daily exar
2	4	Applying t principle of ma balance to some		Power int lecture	Daily exar
1	2	common environmental problems.		Power int lecture	Daily exa and Homewor
2	4	Knowledge of t		Power	Class
2	4	phenomenon nutrient enrichme in		int lecture	assignmer
1	2	lakes and t phenomenon		Power int	a report
1	2	thermal stratificatic Determine the un		lecture Electro	a report
		of both drinki water treatment plants and treatme plants Waste water		c lecture Electro	a report

		Knowledge of t sources a characteristics solid waste, methods disposal solid waste Identify no pollution, its harr and ways to comb it. Identify the m common types pollution in t environment, such air pollution. Knowledge thermal pollution, sources, and ways reduce its impact Waterbodies. Identify radioacti contamination a ways to prevent it.	Water quality in lakes. Lakes characteristics ,Factors Controlling The Eutrophication ,Thermal Stratification ,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 pollution : Sources of the thermal pollution. Radioactive pollution.		

23.Course Evaluation

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

24.Learning and Teaching Resources

Required textbooks (curricu books, if any)	Tariq Ahmed Mahmoud "Environmental Technology", 198 Metcalf and Eddy "Wastewater engineering, treatment a resource recovery", McGraw hill, New York, 2014.
Main references (sources)	Abdul Hadi Yahya Al-Sayegh and Arwa Shaz "Environmental Pollution" Energy, 2002.
Recommended books and references (scientific journals, reports...)	Al-Rafidain Engineering Journal
Electronic References, Websi	Environmental engineering 4enveng.com

Course Description Form

1. Course Name:	
Fluids Mechanics	
2. Course Code:	
ENV247	
3. Semester / Year:	
2023-2024	
4. Description Preparation Date:	
18/2/2024	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 theoretical +2 lab (5)/ 4	
7. Course administrator's name (mention all, if more than one name)	
Name: Mohammed Salim Mahmood Email: mohammedsalim@uomosul.edu.iq	
8. Course Objectives	
Course Objectiv	On successful completion of this course students will be able to: 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).

	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). 4-Correlating the theoretical principles with practical by carrying out laboratory experiments with analysis of results and discussion (iii).

9. Teaching and Learning Strategies

Strategy	This course has several components that include lectures, individual assignments, and e-learning platforms. The course will be taught in Engli and all mandatory assignments have to be submitted within the deadlines be admitted to the exams.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
2	6	I	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-learni platforms	Quizzes (term+Final) exams

1	3	I , II	Pipes in series and parallel	lectures, individual assignments, and e-learni platforms	Quizzes (term+Final) exams

11.Course Evaluation

Quizes	11.67 %
1 st monthly exam	11.67 %
2nd monthly exam	11.67%
Fluid lab. Term Exam	5 %
Fluid lab. Reports	10 %
Fluid lab. Final Exam	10 %

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Esposito, A., 1998, Fluid Mechanics with applications, Prentice Hall, Inc.
Recommended books and references (scientific journals, reports...)	1.White, F. M., 1994, Fluid Mechanics, 3rd ed., MaGraw Hill, Inc. 2. Cengel Y. and Cimbala J., 2014, Fluid Mechanics Fundamentals and Applications, 4th edition, McGraw Hill.
Electronic References, Websites	

Course Description Form

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 Classroom - luup3v4)	
30.Number of Credit Hours (Total) / Number of Units (Total):	
4 / 2	
31. Course administrator's name (mention all, if more than one name):	
Name: Dr. Omar M. Abdulkareem, Email: omaralhakeem@uomosul.edu.iq Name: Rana B. Alshahwany, Email: rn.burha@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 fresh and the hardened properties of the concrete, and understanding concrete performance as a good basics for the building construction and the

	structural design; • Practicing laboratory tests on concrete and its ingredients in addition to the other construction materials.

33. Teaching and Learning Strategies:

Strategy	Power Point Presentations

34. Course Structure: Theoretical

Week	Hours	Required Learning Outcomes	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
		Identify the	Aggregates in Concrete: Definition		

6, 7, & 8	6	aggregate; Recognize the physical and chemical characteristics of the aggregate, Recognize the importance of aggregate characteristics and their contributions to concrete properties.	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	Quizzes 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 design.	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 Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	Practicing laboratory tests on concrete and its ingredients in addition to the other construction materials.	An exploratory tour of the construction materials testing laboratory to identify the devices and tests available there in, in addition to how to prepare the engineering report for the experiment according to the relevant structure.	-	-
2	2	Practicing laboratory tests on Portland cement.	Standard consistency and initial setting time of the cement paste using Vicat apparatus.	Experiment	Report 1
3	2	Practicing laboratory tests on Portland cement.	Compressive strength of the cement mortar cubes and tensile strength of the cement mortar brackets.	Experiment	Report 2
4	2	Practicing laboratory tests on aggregate.	Sieve analysis of the aggregate (fine and coarse).	Experiment	Report 3
5	2	Practicing laboratory tests on aggregate.	Unit weight, specific gravity, absorption and moisture conditions of aggregate (fine and coarse).	Experiment	Report 4
6	2	Practicing laboratory tests on fresh concrete.	Properties of the fresh concrete (Workability, Proportion of sand, Unit weight).	Experiment	Report 5
7	2	Practicing laboratory tests on hardened concrete.	Compressive strength of concrete using cubic and cylindrical specimens.	Experiment	Report 6
8	2	Practicing laboratory tests on steel reinforcement.	Steel test.	Experiment	Report 7
9	2	Practicing laboratory tests on brick and masonry units.	Brick and masonry units tests.	Experiment	Report 8
Monthly Exam					
35. Course Evaluation:					
8 Daily Exams (15) + 2 Monthly Exams (30) + 8 Reports (5) + Final Exam (50)					
36.Learning and Teaching Resources:					
Required textbooks (curricular books, if any)	None				

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

Course Description Form

37. Course Name: Engineering Analysis
38. Course Code: ENV246
39. Semester / Year: spring 2023-2024
40. Description Preparation Date: 2/2024
41. Available Attendance Forms:
42. Number of Credit Hours (Total) / Number of Units (Total) 2/2
43. Course administrator's name (mention all, if more than one name)
Name: Dr. Salim Y. Awad Email: sua@uomosul.edu.iq

44. Course Objectives

Course Objectives	• **Learn** the concept and principles of engineering analysis, and the vital roles that engineering analysis plays in professional engineering practices. • **Learn** 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 **acquire** the ability to use mathematical modeling in problem solving and decision making in dealing with real physical situations.

45. Teaching and Learning Strategies

Strategy	strong emphasis on how students will learn to apply the mathematics that they learned in previous years to solve engineering problems.

46. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2 3 4 5 6 7 8 9 10 11 12 13 14	2x15	learning	**Differential Equations Introduction** **First order ordin differential equations** **1- Separable varia differential equations** **2- Homogeneous differer equations (reducible separable DE)** **3- Exact differential equati Reducible to exact differer equations** **4- Linear differer equations** **Reducible to linear differer equations"Bernoulli Equation"** **5- Second order DE reduce first order DE** **Applications on First-Or ODE** **1- Orthogonal Trajectories** **2- Suspended Cables** **3- Flow through orifices** **4- Motion of bodies** **5- General Applications** **Second and Higher Order Linear Ordinary Differential Equations** **Solution of non-homogeneous linear DE with constant coefficients** **1- Undetermined coefficients method** **2- Variation of parameters method** **Applications on Second and Higher Order Linear ODE** **1. Deflection of beams** **2. Buckling of columns** **3. Simple Vibration**	Interactive lectus	S c c z

47.Course Evaluation

Quizzes 20%
Mid exam 20%
Final exam 60%

48.Learning and Teaching Resources

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 journals, reports...)	Engineering Analysis / Civil Eng 3rd Class Prepared by: Dr. Ahm Sagban Saadoon
Electronic References, Websites	

Course Description Form

49.Course Name: Engineering Analysis

50. Course Code: ENV246

51. Semester / Year: spring 2023-2024

52. Description Preparation Date: 2/2024

53. Available Attendance Forms:

54. Number of Credit Hours (Total) / Number of Units (Total) 2/2

55. Course administrator's name (mention all, if more than one name)

Name: Dr. Salim Y. Awad
Email: sua@uomosul.edu.iq

56. Course Objectives

Course Objectives	• **Learn** the concept and principles of engineering analysis, and the vital roles that engineering analysis plays in professional engineering practices. • **Learn** 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 **acquire** the ability to use mathematical modeling in problem solving and decision making in dealing with real physical situations.

57. Teaching and Learning Strategies

Strategy	strong emphasis on how students will learn to apply the mathematics that they learned in previous years to solve engineering problems.

58. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			**Differential Equations Introduction**	Inter	S

2 3 4 5 6 7 8 9 10 11 12 13 14	2x 15	learning	**First order ordin differential equations** **1- Separable varia differential equations** **2- Homogeneous differer equations (reducible separable DE)** **3- Exact differential equati Reducible to exact differer equations** **4- Linear differer equations** **Reducible to linear differer equations"Bernoulli Equation"** **5- Second order DE reduce first order DE** **Applications on First-Or ODE** **1- Orthogonal Trajectories** **2- Suspended Cables** **3- Flow through orifices** **4- Motion of bodies** **5- General Applications** **Second and Higher Order Linear Ordinary Differential Equations** **Solution of non-homogeneous linear DE with constant coefficients** **1- Undetermined coefficients method** **2- Variation of parameters method** **Applications on Second and Higher Order Linear ODE** **1. Deflection of beams** **2. Buckling of columns** **3. Simple Vibration**	tive lectu s	c c z

59.Course Evaluation

Quizzes 20%
Mid exam 20%
Final exam 60%

60.Learning and Teaching Resources

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	

Course Description Form

61. Course Name:
Engineering mathematics
62. Course Code:
ENV240
63. Semester / Year:
2nd Level/ autumn course 2023-2024
64. Description Preparation Date:
18/2/2024
65. Available Attendance Forms:

- **In class**
- **E- classroom**.

66. Number of Credit Hours (Total) / Number of Units (Total):

4 hours/4 units

67. Course administrator's name (mention all, if more than one name)

Name: **Nadia Afram Yaqoob**
Email: **n.alrhmanyn@uomosul.edu.iq**

68. Course Objectives

Course Objectives	This course provides students with the fundamentals for the following topics: • plane analytic geometry (Circle, parabola, Ellipse, Hyperbola). • partial derivatives for Functions of two or more variables. • Hyperbolic function. • Multiple Integration. • Differential equations (1_{st} order 1_{st} degree).

69. Teaching and Learning Strategies

Strategy	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.

70. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**4**	Identify plane analytic geometry (Circle, Parabola, Ellipse, Hyperbola)	plane analytic geometry	• In-class lectures & tutorial • Use e-classroom to post lectures & homework's	Quizzes
4	**16**	• Identify and understand the partial derivatives for function of two or more variable • use the partial derivatives to find the maximum and minimum of functions of several independent	partial derivative	• In-class lectures & tutorial • Use e-classroom to post lectures & homework's	Quizzes, homework

		variables (Lagrange multipliers method). • 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.			
3	**12**	Identify the hyperbolic functions, their graphs, their derivatives, their integrals, and their inverse functions	Hyperbolic function identities	• In-class lectures & tutorial • Use e-classroom to post lectures & homework's	Quizzes, homework
4	**16**	• use Double integrals to find areas of more general regions in the plane • use polar coordinates to simplify computing a double integral. • use Triple integrals can be to find volumes of still more general regions in space • Use double Integration to find the area, volume, mass, center of gravity, moment and moment of inertia of the functions	Multiple Integration	• In-class lectures & tutorial • Use e-classroom to post lectures & homework's	Quizzes, homework
3	**12**	• Classifying differential equation • Understand the formation and solution of ordinary differential equation • discuss some methods for solving and approximating solutions of the (1st order	Differential Equations (D.E)	• In-class lectures & tutorial • Use e-classroom to post lectures & homework's	Quizzes, homework

		1st degree) differential equations			

71.Course Evaluation

6 quizzes	**10pts**
4homework	**4pts**
First Term Exam	**13pts**
Second Term Exam	**13pts**
Final Exam	**60pts**
Total	**100pts**

72.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Finney, R.L,& Thomas ,G.B, "Calculus" Addison. Wesley publishing company, USA,11th,2011
Main references (sources)	Anton, H., Bivens, I.C., Davis, S., Calculus: Early Transcendentals ,Wiley, 10th edition, 2011.
Recommended books and references (scientific journals, reports...)	Thomas ,G. B. &Finney ,R.L "Calculus and analytic geometry" Addison. Wesley publishing company, 1996.
Electronic References, Websites	https://www.sfu.ca/math-coursenotes/Math%20158%20Course%20Notes/book-1.html https://www.google.iq/books/edition/Advanced_Calculus_of_Several_Variables/6eq-DwAAQBAJ?hl=en&gbpv=1&dq=calculus+of+function+of+several+variables+pdf&printsec=frontcover https://youtu.be/5-CUqogfPLY

Course Description Form

73. Course Name:
Engineering mathematics
74. Course Code:
ENV240
75. Semester / Year:
2nd 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**

Email: **n.alrhmanyn@uomosul.edu.iq**

80. Course Objectives

Course Objectives	This course provides students with the fundamentals for the following topics: • plane analytic geometry (Circle, parabola, Ellipse, Hyperbola). • partial derivatives for Functions of two or more variables. • Hyperbolic function. • Multiple Integration. • Differential equations (1_{st} order 1_{st} degree).

81. Teaching and Learning Strategies

Strategy	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.

82. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**4**	Identify plane analytic geometry (Circle, Parabola, Ellipse, Hyperbola)	plane analytic geometry	• In-class lectures & tutorial • Use e-classroom to post lectures & homework's	Quizzes
4	**16**	• Identify and understand the partial derivatives for function of two or more variable • use the partial derivatives to find the maximum and minimum of functions of several independent variables (Lagrange multipliers method). • Find the error in the dimension, area and volume and estimate the least amount of material for	partial derivative	• In-class lectures & tutorial • Use e-classroom to post lectures & homework's	Quizzes, homework

		constructions tanks by using 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	• In-class lectures & tutorial • Use e-classroom to post lectures & homework's	Quizzes, homework
4	**16**	• use Double integrals to find areas of more general regions in the plane • use polar coordinates to simplify computing a double integral. • use Triple integrals can be to find volumes of still more general regions in space • Use double Integration to find the area, volume, mass, center of gravity, moment and moment of inertia of the functions	Multiple Integration	• In-class lectures & tutorial • Use e-classroom to post lectures & homework's	Quizzes, homework
3	**12**	• Classifying differential equation • Understand the formation and solution of ordinary differential equation • discuss some methods for solving and approximating solutions of the (1st order 1st degree) differential equations	Differential Equations (D.E)	• In-class lectures & tutorial • Use e-classroom to post lectures & homework's	Quizzes, homework

83.Course Evaluation

6 quizzes **10pts**

4homework	**4pts**
First Term Exam	**13pts**
Second Term Exam	**13pts**
Final Exam	**60pts**
Total	**100pts**

84.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Finney, R.L,& Thomas ,G.B, "Calculus" Addison. Wesley publishing company, USA,11th,2011
Main references (sources)	Anton, H., Bivens, I.C., Davis, S., Calculus: Early Transcendentals ,Wiley, 10th edition, 2011.
Recommended books and references (scientific journals, reports...)	Thomas ,G. B. &Finney ,R.L "Calculus and analytic geometry" Addison. Wesley publishing company, 1996.
Electronic References, Websites	https://www.sfu.ca/math-coursenotes/Math%20158%20Course%20Notes/book-1.html https://www.google.iq/books/edition/Advanced_Calculus_of_Several_Variables/6eq-DwAAQBAJ?hl=en&gbpv=1&dq=calculus+of+function+of+several+variables+pdf&printsec=frontcover https://youtu.be/5-CUqogfPLY

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Engineering Surveying			**Module Delivery**	
Module Type	Supported			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENV222				
ECTS Credits	6				
SWL (hr/sem)	90				
Module Level		2	**Semester of Delivery**		4
Administering Department		ENV8	**College**		ENG4
Module Leader	Dr. Mohammed		**e-mail**		mohammed1979eng@uomosul.edu.iq
Module Leader's Acad. Title		Assist. Professor	**Module Leader'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 Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This course aims to introduce the students to the category of Engineering surveying. 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, GPS field procedure. This will be achieved through descriptive lectures.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, it is better to be equal to the number of study weeks. **CLO-1:** The students will be able to define and distinguish the fundamentals of measuring. (i) **CLO-2:** after taking analysis and synthesis design processes, the student can make a primary design of some issues of roads (ii) **CLO-3:** The student will be able to conduct some tests and measurements of surveying, like elevations and coordinates using different devices. (iii) **CLO-4:** The students will be able to make suitable judgments in engineering situations of surveying problems like road construction. (v) **CLO-5:** Report the data obtained from the selective topics of surveying topics given and organized during the course (iv) **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)
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A Introduction Basic Definitions, Types of Surveying, Units, and conversions Linear measurements, tape measurements, and corrections (9 hrs) Part B – Leveling Leveling definitions and instruments, Leveling methods, Longitudinal and cross-sections, Contouring (21hrs) Part C – Theodolites Theodolites, Angles, bearings, coordinates (9 hrs) Part D – Surveying topics Total Station Surveying, GPS principles, Vertical Curves (6 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 Arabic and English, and all mandatory reports have to be submitted within the deadlines.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	20 % (20)	3, 6, 9and 12	CLO-1, CLO-1, CLO-2 CLO-4
	Assignments	7	5% (10)		All
	Projects / Lab.	3	%5(5)		
	Report	10	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	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?**

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

Module Information معلومات المادة الدراسية					
Module Title	Engineering Surveying			**Module Delivery**	
Module Type	Supported			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENV222				
ECTS Credits	6				
SWL (hr/sem)	90				
Module Level		2	**Semester of Delivery**		4
Administering Department		ENV8	**College**		ENG4
Module Leader	Dr. Mohammed		**e-mail**		mohammed1979eng@uomosul.edu.iq
Module Leader's Acad. Title		Assist. Professor	**Module Leader'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 Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This course aims to introduce the students to the category of Engineering surveying. 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, GPS field procedure. This will be achieved through descriptive lectures.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, it is better to be equal to the number of study weeks. **CLO-1:** The students will be able to define and distinguish the fundamentals of measuring. (i) **CLO-2:** after taking analysis and synthesis design processes, the student can make a primary design of some issues of roads (ii) **CLO-3:** The student will be able to conduct some tests and measurements of surveying, like elevations and coordinates using different devices. (iii) **CLO-4:** The students will be able to make suitable judgments in engineering situations of surveying problems like road construction. (v) **CLO-5:** Report the data obtained from the selective topics of surveying topics given and organized during the course (iv) **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)
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A Introduction Basic Definitions, Types of Surveying, Units, and conversions Linear measurements, tape measurements, and corrections (9 hrs) Part B – Leveling Leveling definitions and instruments, Leveling methods, Longitudinal and cross-sections, Contouring (21hrs) Part C – Theodolites Theodolites, Angles, bearings, coordinates (9 hrs) Part D – Surveying topics Total Station Surveying, GPS principles, Vertical Curves (6 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 Arabic and English, and all mandatory reports have to be submitted within the deadlines.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	20 % (20)	3, 6, 9and 12	CLO-1, CLO-1, CLO-2 CLO-4
	Assignments	7	5% (10)		All
	Projects / Lab.	3	%5(5)		
	Report	10	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	Basic Definitions, Types of Surveying, Units, and conversions
Week 2	Linear measurements
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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?**
Required Texts	B. Kavannagh. "Surveying with Construction Applications", 6th edition	yes

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مخطط الدرجات

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	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
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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

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 Classroom - luup3v4)
90.Number of Credit Hours (Total) / Number of Units (Total):
4 / 2
91. Course administrator's name (mention all, if more than one name):
Name: Dr. Omar M. Abdulkareem, Email: omaralhakeem@uomosul.edu.iq Name: Rana B. Alshahwany, Email: rn.burha@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

	performance as a good basics for the building construction and the structural design; • Practicing laboratory tests on concrete and its ingredients in addition to the other construction materials.

93. Teaching and Learning Strategies:

Strategy	Power Point Presentations

94. Course Structure: Theoretical

Week	Hours	Required Learning Outcomes	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 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	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.			
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 design.	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 Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	Practicing laboratory tests on concrete and its ingredients in addition to the other construction materials.	An exploratory tour of the construction materials testing laboratory to identify the devices and tests available there in, in addition to how to prepare the engineering report for the experiment according to the relevant structure.	-	-
2	2	Practicing laboratory tests on Portland cement.	Standard consistency and initial setting time of the cement paste using Vicat apparatus.	Experiment	Report 1
3	2	Practicing laboratory tests on Portland cement.	Compressive strength of the cement mortar cubes and tensile strength of the cement mortar brackets.	Experiment	Report 2
4	2	Practicing laboratory tests on aggregate.	Sieve analysis of the aggregate (fine and coarse).	Experiment	Report 3
5	2	Practicing laboratory tests on aggregate.	Unit weight, specific gravity, and absorption of aggregate (fine and coarse).	Experiment	Report 4
6	2	Practicing laboratory tests on fresh concrete.	Properties of the fresh concrete (Workability, Proportion of sand, Unit weight).	Experiment	Report 5
7	2	Practicing laboratory tests on hardened concrete.	Compressive strength of concrete using cubic and cylindrical specimens.	Experiment	Report 6
8	2	Practicing laboratory tests on steel reinforcement.	Steel test.	Experiment	Report 7
9	2	Practicing laboratory tests on brick and masonry units.	Brick and masonry units tests.	Experiment	Report 8
Monthly Exam					
95. Course Evaluation:					
8 Daily Exams (15) + 2 Monthly Exams (30) + 8 Reports (5) + Final Exam (50)					
96.Learning and Teaching Resources:					

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

Course Description Form

1. Course Name:

PUPLIC SAFETY

2. Course Code:

ENGE329

3. Semester / Year:

Autumn semester/2023-2024

4. Description Preparation Date:

2023-2024

5. Available Attendance Forms:

Inside the class /online

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: Hanan Haqi Ismael Thura Azzam Abed
Email: hanan.eng2014@uomosul.edu.iq
Thura.azzam@uomosul.edu.iq

8. Course Objectives

Course Objectives	• The course aims to teach the engineer the concept of public safety and its role in the system of human development and public life. • public safety and its relationship to public health and occupational safety. • the objectives of public safety, its laws and legislation. • identify the results of work in public safety.

9. Teaching and Learning Strategies

Strategy	The strategy is achieved through lectures, e-learning platforms, and giving home and class works.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Learn about the concep of safety	Introduction: It includes an overview of the concept of safety and its	PowerPoint lecture	Daily exan

2	4	And its relationship to public and occupational healt Learn about the most important legislation and laws Public safety determining Responsibilities The employer, the workers and the relationship between them.	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. an overview of the OSHA organization in occupational safety and health management and its objectives	PowerPoint lecture	Daily exan
2	4	Demonstrate the ability to lead and participate Productively in group situations.	And its legislations in defining the responsibilities of the employer and the workers and their definition of the work environment and the worker and the relationship between them.....,	PowerPoint lecture	Daily exan
2	4	Know the duties of eac supervisor Health and occupation doctor in addition Duties of each engineer The contractor and the official.		PowerPoint lecture	Daily exan
2	4	Know the most importa management functions in detail	Definition of public administration and its five functions	PowerPoint lecture	Daily exan
1	2	Knowledge of the objectives and areas of compatibility engineeri Culture and national safety strategy the public.	Public safety 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 engineer, the contractor	laboratory	Class work
1	2			discussion	Home wor

1	2	Know the appropriate work environment to achieve Occupational safety and health conditions. Know the most importa means of personal protection To ensure that public safety conditions are m Identify the most important signs Indicative and warning methods first aid . Identify the types of risks that affect On human life and how to prevent Of which Knowledge of physical hazards Chemical hazards and damages and resulting injuries	and the security . Management functions A detailed explanation of the function: planning, organizing, staffing, trainin control, supervision, follow up and their components. Human factors engineering adaptation 1. Its objectives and fields 2. The National Strategy for Public Safety and Occupational Health and Securing the Work Environment. 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 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 Overview of work injuries Personal protective equipment, its importance, advantages, shortcomings	PowerPoint lecture PowerPoint lecture And discussion	Report Report

			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, trippi 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. 3. An introduction to		

			chemical hazards, their causes, damages and injuries resulting from them.		

11.Course Evaluation

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

four quizzes, (each 2pt)	8
tow .H.W(each 1. pt.)	2
report	10
term Exam	20pt
Final Exam	60pt
Total	100pt

12.Learning and Teaching Resources

Required textbooks (curricular boo if any)	Code of public safety in the implementation of construction projects (Iraqi construction code) issued by the Ministry of Construction, Housing, Municipalities and Public Works with the Ministry of Planning / first edition 2015 (a basic methodological book for safety material).
Main references (sources)	nothing
Recommended books and references (scientific journals, reports...)	Arab Safety Magazine
Electronic References, Websites	Arab Institute for Safety Sciences - Aiss https:// aiss.co/

Course Description Form

1. Course Name:
Statistics
2. Course Code:
ENV314
3. Semester / Year:
First/ 2023-2024
4. Description Preparation Date:
1/10/2023
5. Available Attendance Forms:
In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week/ total units 2
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Abdulmuhsin Sadullah Shihab Email: mss_qzz@uomosul.edu.iq
8. Course Objectives

Course Objectives	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. Teaching and Learning Strategies

Strategy	Learning and teaching 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 exams and homework with one or more semester exams and then the final exam.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	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

1. Course Name:
Noise pollution
2. Course Code:
ENV390
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)
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	
Course Objectives	• Identify the sources of noise pollution • Describe the physical properties of sound • Understand the factors affecting noise propagation outdoor • Apply physical characteristics of sound wave in the description of sound propagation in the air • Compare between the concepts involved in noise control technologies • Advise on methods of noise reduction and sound insulation for a range of situations • Design road way barrier used to reduce noise level produced by transportation • Submit a report on noise prediction in a specified road way configuration (Case study)

9. Teaching and Learning Strategies	
Strategy	This course has several components that include power point lectures, individual & group assignments, case study report and e-learning platforms.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1-2	4	• Describe the physical properties of sound	**Introduction:** Properties of sound waves, sound power and intensity levels and the decibel, characterization of noise	Power point lecture, Video learning	Quiz
3-4	4	• Identify the various rating systems used for the description of noise data	**Rating systems** the Ln concept, the Leq concept	Power point lecture, Case Study	H.W. Assignments Report
5-6	4	• Understand 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 Effects on Performance, Noise Standards	Power point lecture	Quiz
7-11	10	• 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 barrier used to reduce noise level produced by transportation	**Transmission of sound outdoors** Inverse Square Law, Radiation Fields of a Sound Source Directivity, Airborne Transmission, Traffic noise prediction	Power point lecture, Group Discussion	H.W Assignments, Quiz
12-15	8	• Compare between the concepts involved in noise control technologies • Advise on methods of noise reduction and sound insulation for a range of situations	**Noise 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 Receiver	Power point lecture	Quiz

11. Course Evaluation

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 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, Websites	https://www.fhwa.dot.gov/ENVIRonment/noise/

Course Description Form

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)
4/4
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

Course Objectives	• Recognize the common physical, chemical and biological unit operations encountered in treatment processes (i) • Apply the basic concepts of sciences and engineering to solve issues associated with the treatment of wastewater (i) • Formulate a preliminary design of wastewater treatment plant including preliminary, primary, secondary, and tertiary treatment units (ii) • Develop and solve design problems and analyze the data to evaluate the feasibility of a components of the wastewater treatment plant (ii). • Report the data obtained from the site visits to WWTP that will be organized during the course (iv) • Demonstrate the ability to lead and productively participate in group situations via assigning multidisciplinary design projects for specific wastewater unit processes (vii)

9. Teaching and Learning Strategies

Strategy	This 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. Course Evaluation

5 quizzes 10 pts
5 homework 10 pts
Term Exam 20 pts
Final Exam 60 pts
Total 100 pts

12. Learning and Teaching Resources

Required textbooks (curricular books, if any	Metcalf and Eddy "Wastewater engineering, treatment and resource recovery", McGraw hill, New York, 2014
Main references (sources)	S. Qasim and G. Zhu "Wastewater Treatment and Reuse Theory and Design Examples Volume 1: Principles and Basic Treatment" , Taylor & Francis Group, 2018
Recommended books and references (scientific journals, reports…)	Karia, G.l. and Christian, R.A. "Wastewater treatment, concept and design approach", Prentice Hall of India, New Delhi, 2006.
Electronic References, Websites	https://4enveng.com/

Course Description Form

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:	
Course Objectives	• Learn about the principles, indicators and general concept of sustainability; • 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, • Apprehend the local, regional and global impacts of unsustainable designs, products and processes; • Explore the types of new and renewable energies, and have in-depth knowledge about the eutrophication; • Your ability to use the mathematical and the scientific principles with the sustainability concepts in engineering.
9. Teaching and Learning Strategies:	
Strategy	Power Point Presentations
10. Course Structure:	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 & 2	4	Learn about the principles, indicators and general concept of sustainability	Sustainable development, Conceptions, Development & applications	Presentation	-
3 & 4	4	Explore the types of new and renewable energies	Renewable Energy, New and renewable energy, Sun energy, Wind energy, Waterfalls energy, etc., Applications, How to use	Presentation	Quiz 1
5	2	Have in-depth knowledge about the eutrophication	Eutrophication in surface water, Types of algae, causes , their results on water quality, treatment plants, modeling of nutrients cycles	Presentation	Report 1
6 & 7	4	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	Sustainability of concrete: Introduction, Negative environmental effects of cement and concrete industries, Environmental concerns, Ten qualifications of concrete sustainability	Presentation	Quiz 2
8 & 9	4	Apprehend the local, regional and global impacts of unsustainable designs, products and processes	Environmental impacts of Portland cement production: Introduction, Description of cement production process, Main impacts, Environmental sustainability, Social sustainability, Economic sustainability, Future trends.	Presentation	Report 2
10	2	Able to use the mathematical and the scientific principles with the sustainability concepts in engineering	Environmental impacts of cement manufacture – Mathematical calculations	Presentation	Monthly Exam 1
		Get a useful acquaintance about	Sustainable ready mix 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	Concrete with construction and demolition wastes (CWD): Introduction, Construction & demolition wastes uses, Construction & demolition wastes sources, Construction & demolition wastes classification, Construction & demolition wastes composition, Construction & demolition wastes management, Construction & demolition wastes reuses.	Presentation	Quiz 4
Final Exam					

11. Course Evaluation:

4 Daily Exams (16) + 2 Monthly Exams (14) + 4 Reports (10) + Final Exam (60)

12. Learning and Teaching Resources:

Required textbooks (curricular books, if any)	None
Main references (sources)	● P-C, Aïtcin and S. Mindess, Sustainability of concrete - Modern concrete technology series 17, 1st 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.
Recommended books and references (scientific journals, reports…)	None
Electronic References, Websites	None

نموذج وصف المقرر

1. اسم المقرر:
هندسة البيئة المستدامة
2. رمز المقرر:
ENG436
3. الفصل / السنة:
الخريفي / 2023-2024
4. تاريخ إعداد هذا الوصف:
2024/02/15
5. أشكال الحضور المتاحة:
حضورياً والكترونيا (Google Classroom - lpxnyx7)
6. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي):
2 / 2
7. اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر):
الاسم: د.عمر محمد عبدالكريم، الآيميل: omaralhakeem@uomosul.edu.iq
الاسم: طه أحمد الطيار، الآيميل: ta_tayyar@uomosul.edu.iq
8. اهداف المقرر:

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

9. استراتيجيات التعليم والتعلم:	
الاستراتيجية	عروض تقديمية بالPower Point

10. بنية المقرر:

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

			نتائجها على نوعية المياه، محطات المعالجة، نمذجة الدورات الغذائية		
7 & 6	4	التعرف بشكل مفيد على مميزات الخرسانة المستدامة وفق المفهوم المستدام من خلال التعرف على التأثيرات البيئية لإنتاج السمنت والخرسانة	استدامة الخرسانة: مقدمة، الآثار البيئية السلبية لصناعات السمنت والخرسانة، الاهتمامات البيئية، عشرة مؤهلات لاستدامة الخرسانة	عرض تقديمي	امتحان يومي 2
8 9 &	4	فهم التأثيرات المحلية والإقليمية والعالمية للتصاميم والمنتجات والعمليات غير المستدامة	التأثيرات البيئية لإنتاج السمنت البورتلاندي: مقدمة، وصف عملية إنتاج السمنت، التأثيرات الرئيسية، الاستدامة البيئية، الاستدامة الاجتماعية، الاستدامة الاقتصادية، الاتجاهات المستقبلية	عرض تقديمي	تقرير 2
10	2	القدرة على استخدام المبادئ الرياضية والعلمية مع مفاهيم الاستدامة في الهندسة	التأثيرات البيئية لصناعة السمنت – الحسابات الرياضية	عرض تقديمي	امتحان شهري 1
11	2	التعرف بشكل مفيد على مميزات الخرسانة المستدامة وفق المفهوم المستدام من خلال التعرف على التأثيرات البيئية لإنتاج السمنت والخرسانة	مصنع الخرسانة الجاهزة المستدام - دراسة حالة: المقدمة، نقل المواد، مثال لمصنع الخرسانة الجاهزة المستدام، الاستنتاج	عرض تقديمي	امتحان يومي 3 + تقرير 3
12 13 &	4	احصل على معرفة مفيدة حول مفهوم الاستدامة من خلال التعرف على التأثيرات البيئية لإنتاج السمنت والخرسانة	التحكم في الضوضاء في صناعة السمنت: مقدمة، مصادر الضوضاء في مصانع السمنت، أضرار الضوضاء في مصانع السمنت، المبادئ الأساسية للتحكم في الضوضاء، تقليل الضوضاء في مصانع السمنت	عرض تقديمي	امتحان شهري 2 + تقرير 4
14 15 &	4	احصل على معرفة مفيدة حول ميزات الخرسانة المستدامة	الخرسانة مع مخلفات البناء والهدم: مقدمة، استخدامات مخلفات البناء والهدم، مصادر مخلفات البناء والهدم، تصنيف مخلفات البناء والهدم، تركيب مخلفات البناء والهدم، إدارة مخلفات البناء والهدم، إعادة استخدام مخلفات البناء والهدم	عرض تقديمي	امتحان يومي 2
امتحان نهائي					

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
المراجع الرئيسة (المصادر)	• P-C, Aïtcin and S. Mindess, Sustainability of concrete - Modern concrete technology series 17, 1st

	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.
الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)	لا يوجد
المراجع الإلكترونية، مواقع الانترنيت	لا يوجد

Course Description Form

1. Course Name:
Advanced Drinking Water Treatment
2. Course Code:
ENV490
3. Semester / Year:
Spring/ 2023-2024
4. Description Preparation Date:
13-02-2024
5. Available Attendance Forms:
In Class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week/ 2 units
7. Course administrator's name (mention all, if more than one name)
Name: Musab AbdulJabbar AbdulBaki Email: musabaltamir@uomosul.edu.iq
8. Course Objectives

Course Objectives	• **Learn some specific and advance methods in drinking water treatment** • **Learn methods used to treat the residuals from drinking water treatment plants.**

9. Teaching and Learning Strategies	
Strategy	The students will be prepared to achieve the objectives by class lectures and, the evaluation will take place with home works, daily, termly and course examinations.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	4	ii	Chemical precipitation	Class Lectures	Home Works, Quizzes, terms and course examinations
3-4	4	ii	Ion exchange		
5-7	6	ii	Reverse Osmosis		
8-9	4	ii	Electrical dialazes		
10-15	12	ii	Drinking Water Treatment plant residual management		

11.Course Evaluation

Activity	Points
Daily examinations	10
Home 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). *MWH's water treatment: principles and design*. John Wiley & Sons.
Electronic References, Websites	

Course Description Form

1. Course Name: Estimation

2. Course Code: ENV448

3. Semester / Year: 2023-2024

4. Description Preparation Date:15-20-2024

5. Available Attendance Forms: Class

6. Number of Credit Hours (Total) / Number of Units (Total)

2

7. Course administrator's name (mention all, if more than one name)

Name: Dr. Kaythar A. Ibrahim
Email: kaythar6871@uomosul.edu.iq
Name: Ayad Abdullah
Email: ayad_engineer@uomosul.edu.iq

8. Course Objectives

Course Objectives	• Identifying the measuring units of the different types of quantities items. • Using engineering formulas to calculate the quantities of materials used in construction. • Detect the estimated prices of the construction projects.

9. Teaching and Learning Strategies

Strategy	This course has several components that include classes & lectures, exams. The cou will be taught in Arabic.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	i	Introduction to estimation	Power point+ whiteboard+ discussion	Homework
2	2	ii	Areas & Volumes, Detailed Estimation & Rough Estimation.	Power point+ whiteboard+ discussion	Quiz

3 & 4	4	ii	Soil Excavation	Power point+ whiteboard+ discussion	Exam
5&6	4	i+ii	Measuring of concrete volume & composition according to mix design	Power point+ whiteboard+ discussion	Homework
7&8	4	ii	Measuring of blockwork & stonework.	Power point+ whiteboard+ discussion	Quiz
9&10	4	ii	Quantities calculation of concrete reinforcement steel	Power point+ whiteboard+ discussion	Homework
11	2		Mid-term exam		
12	2	i+ii	Measuring of construction finishing	Power point+ whiteboard+ discussion	Quiz
13	2	i+ii	Pricing and Cost Analysis:	Power point+ whiteboard+ discussion	Exam
14	2	i	Bill of quantity	Power point+ whiteboard+ discussion	Exam
15	2	i	Contract Specification & Conditions	Power point+ whiteboard+ discussion	Exam

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
HomeWorks: 20 marks
Quizzes: 30 marks
Exams: 50 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	B. N. Dutta, "Estimation and Costing in Civil Engineering- Theory and Practice" Twenty-Eight Revised Edition, UBS Publishers, INDIA, 2012.
Recommended books and references (scientific journals, reports…)	Martin Brook, " Estimating and Tendering for Construction Work ", ELSEVIER, Third Edition, 2004.
Electronic References, Websites	