

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Design of Water Treatment Units		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ENV411		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	
Administering Department	ENV8	College	ENG4
Module Leader	Musab A. Altamir	e-mail	Musabaltamir@uomosul.edu.iq
Module Leader's Acad. Title	Assist. Professor	Module Leader's Qualification	M. Sc.
Module Tutor	Layth A. Alanaz	e-mail	laythabdulaleem@uomosul.edu.iq
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	Unit Operations and Processes		Semester 5
Co-requisites module	None		Semester
Module Aims, Learning Outcomes and Indicative Contents			
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Objectives أهداف المادة الدراسية	<p>The aim of this course is to introduce the students to the area of water treatment facilities used in Water Treatment Plant (WTPs) and its design. The course will cover the conventional and advance Water Supply Treatment Units Operation and Process focusing on the design of these units, in addition to the sludge treatment and handling facilities. At the end of the course the students will have a working knowledge of the Drinking water treatment units and have the skills to perform a complete process design of a water treatment plant. This will be achieved through descriptive lectures with design projects and supervised tutorials.</p>		

<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>CLO-1: Recognize the common physical and chemical unit operations encountered in water treatment processes (i)</p> <p>CLO-2: Apply the basic concepts of sciences and engineering to solve issues associated with the treatment of water (i)</p> <p>CLO-3: Formulate a preliminary design of water treatment plant including conventional and unconventional treatment units (ii)</p> <p>CLO-4: Develop and solve design problems and analyze the data to evaluate the feasibility of a components of the water treatment plant (ii).</p> <p>CLO-5: Report the data obtained from the site visits to WTP that will be organized during the course (iv)</p> <p>CLO-6: Demonstrate the ability to lead and productively participate in group situations via assigning multidisciplinary design projects for specific Water Unit Processes (vii)</p>		
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p><u>Part A – Conventional Water Treatment:</u> Conventional unit operation: Design of Intake, Coagulation and Flocculation units, sedimentation unit, Filtration unit and Disinfection unit. (30 hrs)</p> <p><u>Part B – Advance Water Treatment:</u> Lime Soda ash softening, Reverse Osmoses (RO) and membrane filtration, Ion Exchange. (20 hrs)</p> <p><u>Part C – Sludge Management and Treatment:</u> Quantity and characteristics of sludge, volume reduction, flow equalization, chemicals recovery, hydraulic calculations, thickening processes, conditioning processes, dewatering; mechanical and nonmechanical processes. (15 hrs)</p>		
<p>Learning and Teaching Strategies</p> <p>استراتيجيات التعلم والتعليم</p>			
<p>Strategies</p>	<p>This course has several components that include lectures, individual & group assignments, field visits and e-learning platforms. Exercises involving the use of to understand specific unit processes. The course will be taught in English, and all mandatory assignments have to be submitted within the deadlines to be admitted to the exams.</p>		
<p>Student Workload (SWL)</p> <p>الحمل الدراسي للطالب محسوب ل ١٥ اسبوعا</p>			
<p>Structured SWL (h/sem)</p> <p>الحمل الدراسي المنتظم للطالب خلال الفصل</p>	63	<p>Structured SWL (h/w)</p> <p>الحمل الدراسي المنتظم للطالب أسبوعيا</p>	4.2
<p>Unstructured SWL (h/sem)</p> <p>الحمل الدراسي غير المنتظم للطالب خلال الفصل</p>	87	<p>Unstructured SWL (h/w)</p> <p>الحمل الدراسي غير المنتظم للطالب أسبوعيا</p>	5.8
<p>Total SWL (h/sem)</p> <p>الحمل الدراسي الكلي للطالب خلال الفصل</p>	150		
<p>Module Evaluation</p> <p>تقييم المادة الدراسية</p>			

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	10 % (10)	3, 5, 7, 10 and 13	CLO-1, CLO-2, CLO-3, CLO-3, CLO-3
	Assignments	5	10 % (10)	3, 5, 7, 10, and 13	CLO-2, CLO-3, CLO-3, CLO-3, CLO-3
	Projects	1	5 % (5)	8	CLO-2 to CLO-6
	Report	1	5 % (4)	10	All
Summative assessment	Midterm Exam	2hr	10 % (20)	8	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 consideration of water treatment plant planning and design
Week 2	Intake unit design, which include intake structure type, rack and fine screens, intake pipe.
Week 3	Coagulation, coagulation theory, coagulant types, velocity gradient concept, design of coagulation basin.
Week 4	Flocculation, design of flocculation basin.
Week 5	Sedimentation, geometry of settling basin, design of settling basin.
Week 6	Filtration, filtration theory, classification of filters, back washing, design filters unit
Week 7	Disinfection, types of disinfectants, Ct concepts, design of disinfection basin.
Week 8	Advance treatment, classification and types of advance treatments.
Week 9	Lime Soda softening, definitions, calculation of quantity of lime and soda ash.
Week 10	Reverse Osmosis, definitions, types of membrane, design of membrane modules.
Week 11	Ion Exchange, theory of ion exchange, design of ion exchange reactors.
Week 12	Removal of Iron and manganese, definitions, materials used in removals, design of unit basins.
Week 13	Quantity and quality of Sludge.
Week 14	Thickening of processes and Conditioning processes, theory and design of units process and operation.
Week 15	Dewatering; mechanical and nonmechanical processes, units type, design concepts.
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> Qasim, S. R, Motley, E. M. and Zhu, G., (2010). "Water works engineering planning, design and operation", Prentice Hall PTR. 	Yes
Recommended Texts	<ul style="list-style-type: none"> John C. C., et. al., 2012, MWH's water treatment principles and design, 3rd edition, John Wiley & Sons Inc. 	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	Wastewater Treatment Plants Design		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ENV412		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	4	Semester of Delivery	
Administering Department	ENV8	College	ENG4
Module Leader	Dr.Ammar	e-mail	Dr.ammarthamir@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	Unit Operations and Processes	Semester	5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Objectives أهداف المادة الدراسية</p>	<p>The aim of this course is to introduce the students to the area of wastewater treatment plant operation and design. The course will cover wastewater treatment plant units train focusing on the design of preliminary, primary, secondary, and tertiary treatment processes in addition to the sludge treatment and handling facilities. At the end of the course the students will have a working knowledge of the wastewater treatment units and have the skills to perform a complete process and hydraulic design of a treatment plant. This will be achieved through descriptive lectures with design projects and supervised tutorials.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>CLO-1: Recognize the common physical, chemical and biological unit operations encountered in treatment processes (i) CLO-2: Apply the basic concepts of sciences and engineering to solve issues associated with the treatment of wastewater (i) CLO-3: Formulate a preliminary design of wastewater treatment plant including preliminary, primary, secondary, and tertiary treatment units (ii) CLO-4: Develop and solve design problems and analyze the data to evaluate the feasibility of a components of the wastewater treatment plant (ii). CLO-5: Report the data obtained from the site visits to WWTP that will be organized during the course (iv) CLO-6: Demonstrate the ability to lead and productively participate in group situations via assigning multidisciplinary design projects for specific wastewater unit processes (vii)</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p><u>Part A – Preliminary and primary treatment</u> Preliminary unit operation: Design of Screening, Grit removal and sedimentations (20 hrs)</p> <p><u>Part B – Secondary treatment</u> Fundamentals of biological treatment, Design of suspended and attached growth biological treatment systems, description of simplified waster treatment systems (20 hrs)</p> <p><u>Part C – Tertiary and advanced treatment</u> Design of disinfection units: Chlorination, Ozonation, Nutrient removal processes and advanced wastewater treatment processes (15 hrs)</p> <p><u>Part D - Sludge handling and treatment</u> Sludge quantities and characteristics, Design of thickener, digester and drying beds (20 hrs)</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	This course has several components that include lectures, individual & group assignments, field visits and e-learning platforms. Exercises involving the use of computer applications tools to understand specific unit processes. The course will be taught in English, and all mandatory assignments have to be submitted within the deadlines to be admitted to the exams.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	97	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	16 % (16)	1, 5, 12 and 14	CLO-1, CLO-1, CLO-2, CLO-2
	Assignments	5	15 % (15)	2, 3, 4, 6, and 10	CLO-2, CLO-2, CLO-3, CLO-2, CLO-3
	Projects	1	5 % (5)	13	CLO-2 to CLO-6
	Report	1	4 % (4)		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 consideration of wastewater treatment plant planning and design
Week 2	Preliminary unit operation: Screening and collection pit
Week 3	Design of Grit chamber facilities
Week 4	Primary unit operation (PST) Design
Week 5	Fundamentals of biological treatment
Week 6	Design of suspended growth units: Activated sludge processes and modifications
Week 7	Attached Growth systems: Trickling filter,
Week 8	Simplified Systems of waste water Treatment: Aerated lagoons, Stabilization ponds
Week 9	Design of disinfection units: Chlorination, Ozonation, UV disinfection
Week 10	Biological Nutrient removal
Week 11	Advanced Treatment
Week 12	Sludge Handling and treatment
Week 13	Design of gravity thickeners
Week 14	Design of anaerobic Digesters
Week 15	Dewatering units: Design of Drying Beds
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> • Metcalf and Eddy "Wastewater engineering, treatment and resource recovery", McGraw hill, New York, 2014 	Yes
Recommended Texts	<ul style="list-style-type: none"> • S. Qasim and G. Zhu "Wastewater Treatment and Reuse Theory and Design Examples Volume 1: Principles and Basic Treatment" , Taylor & Francis Group, 2018 	Yes
Websites	https://uomosul.edu.iq/en/engineering/environmental-engineering-dept/	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Structural Design		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ENV413			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	4	Semester of Delivery		7
Administering Department	ENV8	College	ENG4	
Module Leader	Dr. Mohammed T. A., Dr. Samir Yasso		e-mail	mohammed1979eng@uomosul.edu.iq syasso@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Professor, Lecturer		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	Reinforced Concrete	Semester	6
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Objectives أهداف المادة الدراسية</p>	<p>An introduction to the reinforced concrete structure and foundation engineering, Characteristics of reinforced concrete elements, Concrete types, Steel Grades, and Loading types. Design of different structural elements subjected to flexure and shear using load and resistance factor design method (LRFD). Design of continuous one-way slabs and beams using ACI coefficients method. Design of two-way slabs using coefficients method. Bearing capacity and foundation types, and analysis and design of wall, spread, and raft footings. Structural design of liquid retaining structures using PCA method, and the design of reinforced concrete retaining Walls. The topics will be covered according to the American Building Code.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.</p> <ol style="list-style-type: none"> 1. Identify the mechanical properties of concrete, and reinforcements. (i) 2. Learning types of foundations and producing designs. (i), (ii) 3. Identify the analysis and design Codes. (i) 4. Identify the behavior of reinforced concrete based on ultimate loads. (i) 5. Produce the design of simple beams and slabs by ultimate strength design method. (i), (ii) 6. Produce the design of continuous beams and one-way slabs. (i), (ii) 7. Produce the design of two-way slabs. (i), (ii) 8. Produce the design of footings. (i), (ii) 9. Produce the design of liquid retaining structures. (i), (ii)
<p>Indicative Contents المحتويات الإرشادية</p>	<p style="text-align: center;">Indicative content includes the following.</p> <p><u>Part A – Design codes and design methods and bearing capacity</u> Defining design codes and methods of design according to American Standards in addition to the bearing capacity (18 hrs)</p> <p><u>Part B – Analysis and design</u> Analysis and design of different structural elements including: one-way continuous slab, two-way slab, continuous beams, retaining walls, footings. (54 hrs)</p> <p><u>Part C – Liquid retaining structures and raft foundations</u> Analysis and design of liquid retaining structures according on the American Code and using the PCA method- including circular and rectangular tanks and raft foundations. (18 hrs)</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	This course has several components that include lectures, individual assignments, field visits- when possible and e-learning platforms. The course will be taught in English, and all mandatory assignments have to be submitted within the deadlines to be admitted to the exams.
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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	82	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20 % (20)	3, 5, ,11 and 13	1 to 8
	Assignments	4	15 % (15)	2, 3, 6, and 10	1 to 9
Summative assessment	Midterm Exam	2hr	15% (15)	7	1 to 5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to concrete structures, materials, design codes, and design loads. Introduction to foundation engineering.
Week 2	Loads on structures and design methodology. Bearing capacity of the soil.
Week 3	Introduction to ACI coefficient method for analysis of continuous one-way slabs and beams. Bearing capacity of the soil- cont.
Week 4	Analysis and design of continuous one-way slabs. Design of spread footing.
Week 5	Analysis and design of continuous one-way slabs-Cont. Design of spread footing- cont.
Week 6	Analysis and design of continuous beams. Design of spread footing- cont.
Week 7	Introduction to analysis and design of two-way slabs using the ACI coefficient method. Design of wall footing.
Week 8	Analysis and design of two-way slabs-Cont. Design of spread footing- cont.
Week 9	Design of spread footing- cont.
Week 10	Introduction to retaining walls.
Week 11	Analysis and design of cantilever retaining walls. Analysis and design of combined footing.
Week 12	Analysis and design of cantilever retaining walls. Analysis and design of combined footing- cont.
Week 13	Introduction to liquid retaining structures. Design of raft foundation.
Week 14	Analysis and design of liquid retaining structures using PCA method. Design of raft foundation-cont.
Week 15	Analysis and design of liquid retaining structures using PCA method- cont. Design of raft foundation-cont.
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Design of Concrete Structures by Nilson, Darwin, and Dolan, 14 th edition. B.M. Das, principles of geotechnical engineering(2006) B.M. Das, principles of geotechnical engineering(2014)	Yes
Recommended Texts	Design of Reinforced Concrete, Jack McCormac and Russell Brown, 10 th edition.	Yes
Design Codes	ACI-318-14M, Building Code Requirements 2014, American Concrete Institute. ASCE 7-10, Minimum Design Loads for Buildings and Other Structures.	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
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Project management and economy		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ENV414		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	
Administering Department	ENV8	College	ENG4
Module Leader	Dr. Kaythar A. Ibrahim Dr. Hamid Idrees Dr. Anas Fakhry Qassid	e-mail	Kaythar6871@uomosul.edu.iq hamidalkhashab@uomosul.edu.iq anasfq@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		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

<p>Module Objectives أهداف المادة الدراسية</p>	<p>This course covers the fundamental concepts and applied techniques to manage project resources effectively and deliver on schedule. Course content addresses fundamental methods for planning, scheduling, organizing, controlling projects. Though project management is universally applicable. Student will learn project management principles and methods with special focus on planning, controlling, and managing projects. Course topics will primarily be the technical aspects of project management Examples include developing the project plan; schedules, and the critical path, resources and resources levelling, MS Project software, S-Curve and cash flow & Evaluating Project cost and schedule performance (Earned Value). Furthermore. This course also, covers the principles of project evaluation; analysis of capital and operating costs of engineering alternatives, benefit-cost ratio; break-even studies, evaluations recognizing risk, replacement and retirement of assets; tax considerations, influence of sources of funds.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p style="text-align: center;">Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.</p> <p>CLO-1: Listing and recognizing project activities and critical paths, bidding document and contract agreement (i)</p> <p>CLO-2: Understanding the principles of project management and the construction works stages, types of construction contract, management level and project control (i)</p> <p>CLO-3: Using Microsoft Project software to schedule the project activities, updating projects, Levelling the resources, getting reports & Printing. (ii)</p> <p>CLO-4 Integrating the time and cost of the project. (ii).</p> <p>CLO-5 Organizing project work progress. (ii)</p> <p>CLO-6: Judging the project efficiency depending on time and budget. (ii)</p> <p>CLO-7: Planning and tracking the project. (ii)</p> <p>CLO-8: Formulating cash flow of projects (ii)</p> <p>CLO-9: Apply the concepts of time-value of money, taking into consideration the impact of interest on investment decisions by comparing between potential candidates and identifying the better investment (i)</p> <p>CLO-10: Evaluate different project/investment opportunities to select the most beneficial by applying the appropriate evaluation method (ii)</p> <p>CLO-11: Demonstrate understanding that assets having different life expectancies cannot be directly compared through use of common life concepts or by using annual worth comparisons (i)</p> <p>CLO-12: Evaluate different project/investment opportunities to select the most beneficial by applying the appropriate evaluation method (ii)</p> <p>CLO-13: Determine the book value of an asset for accounting and tax purposes by applying knowledge of depreciation (i)</p>

	<p>CLO-14: Understand basic accounting concepts through identification of elements of a balance sheet and income statement (ii)</p> <p>CLO-15: Determine the feasibility study of an engineering project through the application of after-tax cash flow analysis using capital tax factors, capital salvage factors, tax rates, and depreciation rates (vii)</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A – Introduction to the project management.</u> Definition of the project, Stages of construction project, bidding documents, contract agreement, construction project team, Types of construction contract, management level, project control, Introduction to engineering economics, and compound interest (15 hrs)</p> <p><u>Part B – Project Scheduling.</u> Construction project planning technique, work breakdown structure, task relationship, Determination of project tasks, breaking down the project into tasks, Ghant chart, Scheduling projects using Critical path method. Choice between alternatives include: present worth method, annual equivalent method, and other comparatives (25 hrs)</p> <p><u>Part C MS Project Software</u> Scheduling the project and assigning resource using MS Project software, project updating and Tracking. Study of Inflation, replacement, and sensitivity analysis (20 hrs)</p> <p><u>Part D – Formulating S-curve & Project cash flow.</u> Calculate work progress Evaluating Project. cost and schedule performance (Earned Value). Study value engineering analysis, and decision tree (15 hrs)</p>

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>This course has several components that include lectures, assignments, exams. Exercises involving the use of MS project software. The course will be taught in English, and all mandatory assignments have to be submitted within the deadlines to be admitted to the exams.</p>

Student Workload (SWL) الحمل الدراسي للطالب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	40 % (40)	3, 4, 12 & 13	1 & 2b (CLO-1, CLO -2), 2 (ALL)
	Assignments	0	0		
	Projects / Lab.	0	0		
	Report	0	0		
Summative assessment	Midterm Exam	2hr	10% (10)	8	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction, Definition of the project, Aim of project management and Stages of construction project.
	Introduction, Interest Formulas and Their Applications
Week 2	Bidding documents, Contract agreement and Construction project team.
	Choice between alternatives, Present worth method
Week 3	Quiz 1, Types of construction contract, Management level and Project control.
	Annual equivalent method
Week 4	Construction project planning technique, Work breakdown structure, Breaking down the project into tasks & Determination of tasks duration.
	Quiz 2, Depreciation
Week 5	Task relationship, Ghant chart, Critical path method and Precedence method.
	Cost/Benefit Criterion
Week 6	Scheduling by Critical path method.
	Average rate of return
Week 7	Project time control (Project Updating).
	The Payback (Pay-Out) Period
Week 8	Mid-Term Exam, Time-cost trade-off.
Week 9	MS Project software: Introduction, Scheduling projects.
	Analysis using rate of return (Irr), and minimum attractive rate of return (Marr)

Week 10	MS Project software: Resources allocation and assignment, Schedule updating & Tracking
	Sensitivity analysis
Week 11	MS Project Software: Reports and Printing
	Replacement and maintenance analysis
Week 12	MS Project Software: Quiz 3.
	Inflation adjusted decisions
Week 13	S-curve & Project cash flow. Work progress calculation
	Quiz 4, value analysis /value engineering
Week 14	Project cost and schedule performance (Earned Value).
	Decision Tree
Week 15	Project cost and schedule performance (Earned Value).
	Application examples in decision tree
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	K. K. Chitkara "Construction Project Management 3rd Edition, Kindle Edition" Mc Graw Hill education, INDIA, 2014.	
Recommended Texts	S. Seetharaman" Construction Engineering and Management fifth edition", UMESH publications, 2015. R. Panneerselvam "Engineering Economics", PHI Learning Private Limited, New Delhi, 2001	
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	Engineering project and technical writing		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ENV415		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	4	Semester of Delivery	
Administering Department	ENV8	College	ENG4
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
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

<p>Module Objectives أهداف المادة الدراسية</p>	<p>The aim of the first part of this course is technical writing which include developing students' knowledge and understanding of the role and conduct of descriptive research methods. Intellectual and methodological debates will be discussed in order to assist students to develop informed opinions and a critical appreciation for other's research. The imperative for ethical research practice will be presented. The course equips students with the skills to review and conduct methodologically sound research as a part of their professional work. Students develop the skills to recognize and reflect on the strengths and limitations of different research methodologies, understand the links between theory and practice, critically assess research, and address ethical and practical issues. The course takes a step-by-step approach to manage and analyze data (including computer assisted), and how to write up and present findings are core components of this course. Students will be equipped with the knowledge and ability to undertake original research projects and develop a set of transferable workplace skills.</p> <p>The aim of the second part of this course is executing a project which include applying the principles of design relating to the subject of concern project. Then the student will apply the basics that have been learned in the first part in the writing the project that will submitted.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.</p> <p>CLO-1: Define research; explain and apply research terms; describe the research process and the principal activities, skills and ethics associated with the research process (i, v)</p> <p>CLO-2: Applying the basic concepts of design required in the project (ii).</p> <p>CLO-3: Demonstrate knowledge of research processes (reading, evaluating, and developing) (vi);</p> <p>CLO-4: Perform literature reviews using print and online databases (vi);</p> <p>CLO-5: Identify, explain, compare, and prepare the key elements of a research report (i);</p> <p>CLO-6: Develop their ability to skillfully communicate orally with a gathering of people (iv);</p> <p>CLO-7: Choose relevant research knowledge to successfully complete their research report components of a program (i);</p> <p>CLO-8: Analyze the components of research report (i);</p> <p>CLO-9: Develop their ability to work adequately on teams and to set up objectives, plan activities, meet due dates (vii)</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A – Introduction</u> Important Course Rules and Policies, design of research report, and how to formulate the title of research report (3 hrs).</p> <p><u>Part B – Research preparation</u> Data gathering and collection, how to check reliability of literatures, research report makeup, Research ethics and avoid plagiarism (5 hrs).</p> <p><u>Part C – Writing and presenting</u></p>

	How to write an introduction?, formatting figures and tables, using of (word office) in report writing and formatting, Citation, referencing, how to present the research report? (7 hrs).
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This course has several components that include lectures, individual & group assignments, field visits and e-learning platforms to development the ability and skills of students to writing the and presenting the report . Project involving the use of computer applications tools to design the project items.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	6	20 % (20)	3,5, 7, ,9,11, and 12	CLO-1, CLO-3, CLO-4, CLO-5, CLO-6, CLO-7
	Assignments	1	3	2	CLO-2
	Projects	1	17% (20)	13	All
	Report				
Summative assessment	Midterm Exam	2hr	10% (10)	13	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to class: Important Course Rules and Policies
Week 2	Design of research report
Week 3	How to formulate the title of research report
Week 4	Research plan preparation: Data gathering and collection
Week 5	How to check reliability of literatures
Week 6	How to arrangement collecting data in different chapters
Week 7	Research report makeup
Week 8	Research ethics and avoid plagiarism
Week 9	How to write an introduction?
Week 10	Formatting figures and tables
Week 11	Using of (word office) in report writing and formatting
Week 12	Citation
Week 13	Referencing
Week 14	How to present the research report?
Week 15	Using of (power point office) in presentation
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	Research Methodology: A Step-by-Step Guide for Beginners, Sage Publications Ltd. By Ranjit Kumar	Yes
Recommended Texts		
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	Industrial and Petroleum Liquid Waste		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ENV421		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	
Administering Department	ENV8	College	ENG4
Module Leader	Dr. Mohammed Salim Shihab, Dr. Hamed I. Al-Khashab		e-mail Shihab77@uomosul.edu.iq hamidalkhashab@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Nada Abd Al-Razzaq Al-Dulaimi	e-mail	nada.abd@uomosul.edu.iq
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	Wastewater Treatment Plant Design	Semester	7
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 define the characteristics of industrial wastewater, manufacturing processes, and management strategies for pollution prevention and waste minimization; In-plant survey; Identifying wastewater generating operations; Preparing mass balance, calculations for industrial operations, In-plant control; Industrial water conserving and recycling. The course will cover Industrial wastewater treatment technologies (Equalization, Floatation, Neutralization, Microfiltration), Studying of selected wastewater industries and wastewater treatment.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<p>Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.</p> <p>CLO-1: Analysis the industrial activity and identify the environmental problems. (i) CLO-2: Plan strategies to control and reduce pollution. (i) CLO-3: Design the most appropriate technique to control and treat industrial pollution. (ii) CLO-4: Apply environmental management systems (EMS) to an industrial activity. (vii) CLO-5: Evaluate different treatment methods to select the most beneficial (ii) CLO-6: Optimizing the manufacturing processes to reduce the discharged wastes (ii)</p>
Indicative Contents المحتويات الإرشادية	<p style="text-align: center;">Indicative content includes the following.</p> <p><u>Part A – Industrial Survey</u> Introduction, Characteristics of industrial wastewater, In-plant survey; Identifying wastewater generating operations; Preparing mass balance calculations for industrial operations, In-plant control; Volume and strength reduction (12 hrs)</p> <p><u>Part B – Industrial wastewater treatment technologies:</u> Neutralization, Equalization unit, Flotation unit, Microfiltration process (Membrane) (12 hrs)</p> <p><u>Part C – Selected Industries study</u> Dairy industry, Textile industry, Tannery industry, Soft drinks industry (21 hrs)</p>

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This course has several components that include lectures, individual assignments, and e-learning platforms. Exercises involving problems. The course will be taught in English, and all mandatory assignments have to be submitted within the deadlines to be admitted to the exams.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	16 % (16)	2, 5, ,7 ,17	CLO-1, CLO-2, CLO-3, CLO-3
	Assignments	4	16 % (16)	5, 8, and 12	CLO-2, CLO-3,CLO-4 CLO-6
	Projects / Lab.	1	18% (18)	All	All
	Report	-----	-----	-----	-----
Summative assessment	Midterm Exam	2hr	10% (10)	10	CLO-1, CLO-2, CLO-3, CLO-4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction, Characteristics of industrial wastewater.
Week 2	In-plant survey; Identifying wastewater generating operations;
Week 3	Preparing mass balance calculations for industrial operations
Week 4	In-plant control; Volume and strength reduction
Week 5	Industrial wastewater treatment technologies: Neutralization,
Week 6	Equalization unit
Week 7	Flotation unit
Week 8	Microfiltration process (Membrane)
Week 9	Studying of selected wastewater industries: Dairy industry
Week 10	Textile industry
Week 11	Tannery industry
Week 12	Soft drinks industry
Week 13	Sources of pollutants in petroleum industry, refineries quantity and characteristics
Week 14	Pollution reduction inside the refinery-API separator
Week 15	Project presentation
Week 16	Preparatory week before the final Exam

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

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> Nemerow L. N., " Industrial Waste Treatment", Elsevier Science & Technology Books, Netherlands, 2006 Eckenfelder W.W "Industrial pollution control, Mc Graw Hill Int. 3rd Ed.,2000. 	Yes
Recommended Texts	<ul style="list-style-type: none"> Metcalf and Eddy- "wastewater engineering-treatment and reuse" 4th edition ,2004. 	Yes
Websites		

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Soil and Ground Water Pollution		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ENV422		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	
Administering Department	ENV8	College	ENG4
Module Leader	Dr. Anas Fakhry Qassid Dr. Ayman Waleed	e-mail	anasfq@uomosul.edu.iq aymanwaleed1975@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	14/06/2023	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

<p>Module Objectives أهداف المادة الدراسية</p>	<p>Knowledge of the behavior of compounds in soil and their effects on organisms (human beings, plants, soil biota) is required in order to assess soil quality and to select proper soil remediation methods in case of severe pollution. The field of application is not limited to soil but includes sediments and solid wastes. The course focuses on soil risk assessment (soil quality evaluation) and the basic knowledge necessary to be able to apply a risk assessment procedure to polluted soil sites. Basic knowledge comprises compound behavior in soils (speciation, transport, uptake) and effects on soil organisms (bioavailability, uptake, dose-response relationships, risk assessment). Speciation focuses on adsorption to soil particles and on complexation reactions: mechanism and modeling, especially of heavy metals with (dissolved) organic matter.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>CLO-1: Explain the legal, planning and environmental health issues in relation to redevelopment of contaminated sites; (i) CLO-2: Explain the main scientific and engineering principles of soil and groundwater remediation; (i) CLO-3: Apply knowledge in water and land conservation projects (ii) CLO-4: Design and plan a remediation of polluted soils; (ii) CLO-5: Complete a risk analysis of a contaminated site; (vii) CLO-6: Apply Geostudio -2007 – software to predict transport of soil pollution. (ii)</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p><u>Part A</u> – Introduction to Soil composition, its structure, types of soils, Study a properties of soil (6 hrs) . <u>Part B</u> – Basic chemistry which related to soil pollution and groundwater (6 hrs) <u>Part C</u> Sources, role, and behavior of substances in soil and water (6 hrs) <u>Part D</u> – Transport processes of substances in soil and water (6 hrs) <u>Part E</u> – Soil Analysis for soil pollution (30 hrs) <u>Part E</u> – Soil pollution Remediation (6 hrs)</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<p>Strategies</p>	<p>This course has several components that include lectures, assignments, exams. Exercises and introduce a report for soil pollution analysis for each student groups. The course will be taught in Arabic, and all mandatory assignments have to be submitted within the deadlines to be admitted to the exams.</p>
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Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	16%	4, 6, 9, and 14	1 (CLO-1, CLO -2), 2 (CLO-1), 3 (CLO-2, CLO-3), 4(COL-1,CLO-2,CLO-3,CLO-4)
	Assignments	2	4%	6, and 13	1 (CLO-1, CLO -2), 2 (All),
	Projects / Lab.	1	20%	2,3,4,5,6,7,8,9, 10,11,12,13,14, and 15	All weeks (CLO-1, CLO-2, CLO-3, and CLO-5)
	Report	0	0		
Summative assessment	Midterm Exam	2hr	10%	12	(CLO-1, CLO-2, CLO-3, CLO-4, CLO-5)
	Final Exam	3hr	50%	16	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Environmental Pollution, Environmental Pollutants
Week 2	The Origin of Soil, Soil constituents, Soil Properties, and Soil Types and Classification
Week 3	Basic Environmental Chemistry – Introduction, Activity
Week 4	Basic Environmental Chemistry -Background thermodynamics introduction
Week 5	Basic Environmental Chemistry – Fugacity, Chemical Equilibrium and kinetics
Week 6	Application examples about composition of solid waste
Week 7	Soil Pollution, Sources, causes and effects
Week 8	Behavior of substances in Soil- Solid phase constituents, and dissolved phase constituents
Week 9	Behavior of substances in Soil- Organic materials, and Nutrients
Week 10	Behavior of substances in Soil- Heavy metals
Week 11	Mid-Term Exam - Time-cost trade-off.
Week 12	Soil remediation
Week 13	Mass transport processes, and Flick's law
Week 14	Diffusion in porous media, dispersion
Week 15	Application of Geostudio Software in mass transport to soil contamination problems
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction, collection of samples
Week 2	Laboratory Safety – explaining MSDS
Week 3	Physical analysis of soil – Moisture content and Moisture Factor
Week 4	Volumetric distribution of soil components , and Determination of soil texture
Week 5	Chemical Analysis of soil- pH
Week 6	Electro-Conductivity
Week 7	Calcium Carbonate (CaCO_3) Determination
Week 8	Organic Material
Week 9	Midterm Exam
Week 10	Cationic Exchange Capacity (CEC)
Week 11	Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$)
Week 12	Sodium Na^+ , Potassium K^+ , Calcium Ca^{2+} , and Magnesium Mg^{2+} Determination
Week 13	Nutrients – Nitrogen (N)
Week 14	Nutrients – Phosphor (P)
Week 15	Soil carbon estimation
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Marcel van der Perk "Soil and Water Contamination", The M.C. Eschers company, 2006	yes
Recommended Texts	Simone Pascucci, " Soil Contamination ", Janeza Trdine 9, 51000 Rijeka, Croatia,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	Estimation and Specifications		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ENV423		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	4	Semester of Delivery	
Administering Department	ENV8	College	ENG4
Module Leader	Dr. Kaythar A. Ibrahim	e-mail	Kaythar6871@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	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

<p>Module Objectives أهداف المادة الدراسية</p>	<p>This course provides a comprehensive understanding of the role of an Estimation in the construction industry. Students will learn the principles, techniques, and practices involved in, with a specific focus on estimation of construction projects element. The course covers quantity & cost estimation. The coarse cover the rough and detailed quantity survey. Measuring soil excavation, volume of concrete, masonry work, RC shuttering, RC steel quantity, construction finishing, sanitary and plumbing element are also covered. The coarse extended to use the excel in estimation. The Bill of quantity, Pricing and cost analysis, project condition and specification are also included in this course. Practical exercises and case studies are included to enhance learning and application of concepts.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p style="text-align: center;">Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.</p> <p>CLO-1: Listing and recognizing the main principle used in estimation. (i) CLO-2: Understanding the general and special specification and conditions. CLO-3: Understanding both rough and detailed estimation. (i) CLO-4: Using estimation technique for calculation the quantity of construction project elements. (i) CLO-5 Integrating the computer tools for quantity calculation. (ii). CLO-6 Evaluating the cost of construction projects elements. (ii) CLO-7: Producing different method for measuring quantities. (ii)</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p style="text-align: center;">Indicative content includes the following.</p> <p><u>Part A – Introduction to the project management.</u> Definition & importance of estimation, Quantity sheet, allowance of waste, Accuracy of quantities, prevention of mistakes & Measuring units. Areas & Volumes, Detailed Estimation & Rough Estimation. (6 hrs)</p> <p><u>Part B – Project Scheduling.</u> Measuring of Soil Excavation, Concrete volume & composition, blockwork & stonework, steel for RC elements, RC Shuttering, construction finishing, sanitary & plumbing elements (21 hrs)</p> <p><u>Part C MS Project Software</u> Pricing, Cost Analysis & Estimation using Excel (9 hrs)</p> <p><u>Part D – Bill of quantity, general and special projects conditions and specification. (9 hrs)</u></p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	This course has several components that include classes & lectures, exams. Exercises involving the use of Excel software. The course will be taught in English.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	28 % (28)	4 and 12	1 (CLO-1, CLO -3, CLO -4), 2 (ALL)
	Assignments	4	12 % (12)		CLO-3, CLO-4, CLO-4, CLO-6
	Projects / Lab.	0	0		
	Report	0	0		
Summative assessment	Midterm Exam	2hr	10% (10)	8	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to estimation, Definition & importance of estimation, Quantity sheet, allowance of waste, Accuracy of quantities, prevention of mistakes & Measuring units.
Week 2	Areas & Volumes, Detailed Estimation & Rough Estimation.
Week 3	Soil Excavation for: Raft foundation, Piping & manholes, wall footing, swimming pool & Water channel, ...etc.
Week 4	Measuring of concrete volume & composition according to mix design. Volume of concrete & composition for: footing, water tanks, RC building elements, shaded area, swimming pool, ...etc.
Week 5	Measuring of blockwork & stonework.
Week 6	Estimation of quantities of steel & RCC elements for footing, columns, beams, slabs, staircase, ...etc.
Week 7	Measuring of RC Shuttering for footing, columns, beams and slabs, staircase, etc.
Week 8	Measuring of construction finishing (Plastering, flooring, roofing, ceramic cladding, stone cladding, skirting & painting). Measuring of door & windows
Week 9	Measuring of sanitary & plumbing elements.
Week 10	Pricing and Cost Analysis: Introduction to pricing strategies, Cost analysis and rate development. Material and labor cost estimation. Overhead and profit considerations.
Week 11	Pricing and Cost Analysis: Cost calculation sheet, Determination of construction item price.
Week 12	Estimation using Excel.
Week 13	Bill of quantity, general and special projects conditions.
Week 14	General Specification.
Week 15	Special Specification.
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	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Recommended Texts	B. N. Dutta, "Estimation and Costing in Civil Engineering-Theory and Practice" Twenty-Eight Revised Edition, UBS Publishers, INDIA, 2012.	
Required Texts	Martin Brook, " Estimating and Tendering for Construction Work ", ELSEVIER, Third Edition, 2004.	
Websites	https://uomosul.edu.iq/en/engineering/environmental-engineering-dept/	
Week 7		

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	Environmental Impact Assessment and Regulations		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ENV424		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	4	Semester of Delivery	8
Administering Department	ENV8	College	ENG4
Module Leader	Dr. Mohammed S. Shihab	e-mail	Shihab77@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	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	<p>The aim of this course is to define Environmental protection Act, Rules and Standards, EIA guidelines and predict the environmental consequences of human development activities and to plan appropriate measures to eliminate or reduce adverse effects and to augment positive effects. EIA aims to facilitate sustainable development. The course will cover Project Concept / Identification, Project Appraisal and Decision. At the end of the course the students will have a knowledge of the EIA and have the skills to perform a complete analysis and report that can be understood by all the related stakeholders. This will be achieved through descriptive lectures with project assignments.</p>
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<p>Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.</p> <p>CLO-1: Defining Environmental protection Act, Rules and Standards, EIA guidelines. (i)</p> <p>CLO-2: Apply environment impact assessment methods (i)</p> <p>CLO-3: Determining and managing the Potential impacts (direct and indirect, individual and cumulative) of projects (i)</p> <p>CLO-4: Proposing human actions (projects, plans, programs, legislation, activities) and their alternatives on the environment (i).</p> <p>CLO-5: Report the data obtained from the site visits that will be organized during the course (iv)</p> <p>CLO-6: Demonstrate the ability to participate in group situations via assigning multidisciplinary EIA for specific projects (vii)</p>
Indicative Contents المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><u>Part A – EIA Introduction</u> Environmental Protection Acts, Rules, Regulations and Standards (5 hrs)</p> <p><u>Part B – Environment Impact Assessment</u> Environment Impacts, Identify Activities ,Impact Prediction Methodologies Reviewing of EIA and EMP Reports,(15 hrs)</p> <p><u>Part C – Environment Management</u> Natural Resources Conservation, Conservation of Energy, Pollution prevention Disposal of Treated effluents Solid Waste Disposal Environmental Audit Concept of green cities (10 hrs)</p>

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This course has several components that include lectures, individual & group assignments, field visits and e-learning platforms. Exercises involving the use of The course will be taught in English, and all mandatory assignments have to be submitted within the deadlines to be admitted to the exams.

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	67	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10 % (10)	1, 5, ,12	CLO-1, CLO-3, CLO-4,
	Assignments	3	10 % (10)	2, 6, and 10	CLO-2, CLO-3, CLO-4,
	Projects / Lab.	1	20 % (20)	13	CLO-2 to CLO-6
	Report	0	0		-----
Summative assessment	Midterm Exam	2hr	10% (10)	7	CLO-1, CLO -2 ,CLO-3, CLO-4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction, Environmental Protection Acts, Rules, Regulations and Standards
Week 2	Environmental Impact Assessment: Definition and scope,
Week 3	Preliminary screening requiring EIA of projects
Week 4	Impact identification
Week 5	Assessment of Impact
Week 6	Impact Evaluation
Week 7	Types of EIA, rapid and comprehensive
Week 8	Methods of environment impact assessment; ad-hoc method,
Week 9	maps and overlays, check lists, matrix, cause condition impacts.
Week 10	Procedure For EIA Clearance: EIA review and screening; state level screening,
Week 11	Clearance from DOE and MOEF.
Week 12	Environmental Management: Preventive policy of environment,
Week 13	Project presentation
Week 14	Project presentation
Week 15	Project presentation
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	Teachers Manual, ENVIRONMENTAL IMPACT ASSESSMENT For Science, Art, Management and Other Post Graduate Courses, 2007	Yes
Recommended Texts	Lawrence, David P, Environmental Impact Assessment (Practical Solutions to Recurrent Problems), Wiley International, New Jersey.	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
<p>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.</p>				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Civil Drawing		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ENV425		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	
Administering Department	ENV8	College	ENG4
Module Leader	Samir Yasso	e-mail	syasso@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	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	Drawing by computer, Reinforced Concrete	Semester	2, 6
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Using AutoCAD to produce technical drawings utilizing the knowledge from past design subjects. The course aims to introduce the technical drawings and format, the structural drawings of different elements like slabs, beams, footings. In addition, the subject will tackle the technical drawings of plumbing. The final goal is for the students to be able to produce technical drawings to interpret the designs carried out by the students.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Identify the information required to produce technical drawings. (i) 2. Distinguish between different types of technical drawings and their requirements. (i) 3. Produce structural plans. (ii) 4. Develop details of structural elements and sections. (ii) 5. Construct plumbing plans. (ii) 6. Provide details of plumbing and fittings. (ii)
Indicative Contents المحتويات الإرشادية	<p><u>Part A – Introduction to technical drawings</u> Introduction to technical drawings and their types. (15 hrs)</p> <p><u>Part B – Structural Drawings</u> Structural details of different structural elements including: one-way continuous slab, two-way slab, continuous beams, and footings. (40 hrs)</p> <p><u>Part C – Plumbing drawings</u> Details and drawings of plumbing plans and fittings. (20 hrs)</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	This course has several components that include lectures, individual assignments, and e-learning platforms. The course will be taught in English, and all mandatory assignments have to be submitted within the deadlines to be admitted to the exams.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20 % (20)	3, 5, ,11 and 13	All
	Assignments	5	20 % (20)	2, 3, 6, and 10	All
Summative assessment	Midterm Exam	2hr	10% (10)	7	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to civil drawings.
Week 2	Plans details and symbols
Week 3	Utilizing CAD in civil drawings.
Week 4	Structural Drawings: Plans
Week 5	Structural Drawings: Slabs
Week 6	Structural Drawings: Slabs- cont.
Week 7	Structural Drawings: Beams
Week 8	Structural Drawings: Beams- cont.
Week 9	Structural Drawings: Columns
Week 10	Structural Drawings: Spread footings
Week 11	Structural Drawings: Wall footings
Week 12	Plumbing
Week 13	Plumbing- cont.
Week 14	Selected topics
Week 15	Selected topics
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
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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	ACI Detailing manual, 2020. Structural Detailing For Architecture, Building and Civil Engineering, 2 nd edition, 1991.	Yes
Recommended Texts		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	Engineering project	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ENV426		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4		
Administering Department	ENV8	College	ENG4
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
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	Engineering Project and Technical Writing	Semester	7
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 executing a project which include applying the principles of design relating to the subject of concern project. Then the student will apply the basics that have been learned in the writing the project that will submitted.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<p style="color: red; text-align: center;">Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.</p> CLO-1: An ability to distinguish, define, identify, formulate, and solve engineering problems by applying principles of engineering science and mathematics (i). CLO-2: An ability to produce engineering designs that meet desired needs within certain constraints by applying both analysis and synthesis in the design process (ii). CLO-3: An ability to skillfully communicate orally with gathering of people and in writing with various managerial levels (iv). CLO-4: An ability to perceive ethical and professional responsibilities in engineering cases and make brilliant judgments taking into account the consequences in worldwide financial, ecological, and societal considerations (v). CLO-5: An ability to perceive the continual necessity for professional knowledge growth and how to find, assess, assemble, and apply it properly (vi). CLO-6: An ability to work adequately on teams and to set up objectives, plan activities, meet due dates, and manage risk and uncertainly (vii).
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	This course has several components that include group team project, field visits and e-learning platforms to guide and follow up the students in applying basic concepts of sciences and engineering to solve issues associated with subject of project. Project may involve the use of computer applications tools to design the project items. At final the student will submit the project as report and he present it orally.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب ل 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	92	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes				
	Assignments				
	Projects	1	40% (40)	All	All
	Report				
Summative assessment	Midterm Exam	2hr	10% (10)	11	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	
Week 16	

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		
Recommended Texts		
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.