

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



Academic Program and Course Description Guide

2026

Introduction:

The educational program is a 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:University of Mosul.....

Faculty/Institute:College of Environmental Sciences.....

Scientific Department:Department of Environmental Technologies.....

Academic or Professional Program Name: BSc of Science\ Environmental Technology

Final Certificate Name: BSc of Science\ Environmental Technology.....

Academic System:.....Annual - Bologna.....

Description Preparation Date: 20-6-2026

File Completion Date: 25-6-2026

Signature: 

Head of Department Name:

Hazim Jumaa Mahmood

Date: 30/6/2026

أكاديمية العلوم البيئية
قسم تقانات البيئة

Signature: 

Assistant Dean for Scientific Affairs Name:

Mohammed Walced Saeed

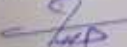
Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 30/6/2026

Signature: 

جامعة الموصل
كلية العلوم البيئية
شعبة ضمان الجودة وتقييم الأداء

جامعة الموصل
كلية العلوم البيئية
رئيسة

Approval of the Dean

Muthanna Jasim Mohammed

1. Program Vision

Preparing specialized competencies capable of contributing effectively in protecting the environment, achieving sustainable development and enabling the graduate to compete in the labor market.

2. Program Mission

Preparing specialized and qualified scientific staff in the field of environmental protection technologies and managing its resources by providing high -quality education based on technical analysis of environmental problems.

3. Program Objectives

1. Providing graduates with cognitive skills in the areas of environmental technologies and their suitability to the labor market and enabling them to apply these skills.
2. Developing technical skills for students in the field of scientific research and graduate studies and enabling them to describe environmental problems and develop appropriate solutions for them.
3. Development of environmental academic capabilities and awareness -raising collective action.
4. Dependence of environmental values and education that contribute to the service of society.
5. Employing practical capabilities in the areas of environmental technologies and in line with the need of the labor market.
6. The graduate must have sustainability techniques and methods of employment in practice.
7. Providing the graduate skills in environmental management and calculating costs.

4. Program Accreditation

The program doesn't have program accreditation.

5. Other external influences

None

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	5	11	8%	Basic course
College Requirements	5	20	14%	Basic course
Department Requirements	32	115	79%	Basic course
Summer Training		None		Basic course
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
First / 2025-2026	ENVT102	General Chemistry	theoretical practical	2
	ENVT101	General Physics	theoretical practical	2
	ENVT103	General Biology	theoretical practical	2
	ENVT104	Mathematics1	theoretical	2
	UOM102	English language 1	theoretical	2
	ENVT105	Geology	theoretical practical	2
	ENVT108	Mathematics2	theoretical	2
	ENVT107	Environmental Science	theoretical	2
	UOM101	Arabic Language 1	theoretical	2

	UOM104	Human rights and democracy	theoretical	2
	ENVT106	Analytical Chemistry	theoretical practical	2
	UOM103	Computer science 1	theoretical practical	2
Second / 2025-2026	ENVT212	Hydrology 1	theoretical practical	2
	ENVT209	Fluids Mechanic1	theoretical practical	2
	ENVT211	Environmental Statistics	theoretical	2
	ENVT213	Soil Physics	theoretical practical	2
	ENVT210	Environmental Chemistry 1	theoretical practical	2
	UOM2012	Arabic Language 2	theoretical	2
	UOM2050	The Crimes of the Baath Regime in Iraq	theoretical	2
	ENVT214	Fluids Mechanic2	theoretical practical	2
	ENVT215	Hydrology 2	theoretical	2
	UOM2032	Computer science 2	theoretical	2
	ENVT218	Engineering Analysis	theoretical	2
	ENVT216	Environmental Chemistry 2	theoretical practical	2
	ENVT217	Environmental Geology	theoretical practical	2
	UOM2022	English language 2	theoretical	2
third / 2024-2025	EnvTch31	Water treatment	theoretical practical	2
	EnvTch32	Measurement technologies	theoretical	2
	EnvTch33	GIS	theoretical practical	2
	EnvTch34	Engineering analysis	theoretical	2
	EnvTch35	Solid waste treatment	theoretical	2
	EnvTch36	Soil pollution	theoretical practical	2
	EnvTch37	Biochemistry	theoretical practical	2

	EnvTch38	Industrial waste management	theoretical	2
	EnvTch39	Thermodynamics	theoretical	2
fourth / 2024 -2025	EnvTch41	Wastewater treatment	theoretical practical	2
	EnvTch42	Environmental regulations	theoretical	2
	EnvTch43	Irrigation	theoretical	2
	EnvTch44	Air pollution	theoretical	2
	EnvTch45	Urban planning	theoretical	2
	EnvTch46	Remote sensing	theoretical practical	2
	EnvTch47	Water reuse	theoretical	2
	EnvTch48	Environmental cost and management	theoretical	2
	EnvTch49	Renewable energy	theoretical	2
	EnvTch410	Graduation project	theoretical	2

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	A1 Teaching basic concepts and topics of the environment - A2: Providing practical field and laboratory skills - A3: Follow environmental protection methods and avoid incorrect behaviors that harm the environment - A4 Developing the student's talents and raising his scientific and practical competence to ensure community involvement in environmental awareness
Skills	
Learning Outcomes 2	B1 Scientific field visits –
Learning Outcomes 3	B2 Conduct laboratory tests - B3 Decision making in solving environmental problems B4 Preparing scientific reports
Ethics	
Learning Outcomes 4	C1 Developing a sense of the necessity of protecting the local environment. -
Learning Outcomes 5	C2 Enhancing the spirit of group cooperation through group work in preparing scientific reports. - C 3 Voluntary projects for students in cleaning campaigns.

9. Teaching and Learning Strategies

- **Interactive Lectures:** Use of multimedia presentations, videos, and visual teaching aids to enhance students' understanding and engagement.
- **Laboratory Sessions:** Conducting practical experiments to develop students' hands-on skills and reinforce theoretical concepts.
- **Field Visits:** Organizing field trips to observe real-world engineering applications and professional practices.
- **Problem-Based Learning (PBL):** Engaging students in solving authentic engineering problems to develop critical thinking and problem-solving skills.
- **Design Projects:** Assigning small-scale design projects to encourage creativity, teamwork, and the practical application of engineering principles.
- **Group Discussions and Seminars:** Promoting collaborative learning and the exchange of ideas through guided readings, research presentations, and scientific discussions.
- **Technology Integration:** Utilizing simulation tools and software applications (such as spreadsheets and modeling tools) to enhance learning, analysis, and decision-making skills.

10. Evaluation methods

- Written Examinations (Midterm and Final Exams)
- Quizzes
- Homework Assignments
- Scientific Reports
- Individual and Group Projects
- Oral Presentations
- Practical and Laboratory Examinations
- Classroom Discussions
- Case Studies
- Portfolio Assessment
- Field Training and Supervisor Evaluation
- Graduation Project (Capstone Project) Assessment

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	
Assistant Professor Hazim Jumaa Mahmood		Geochemistry			Staff	
Assist. Lecturer Omar Khair		Soil			Staff	

Aldin		mechanics				
Assist. Prof. Dr. Eman Abdulmunaim		physical chemistry			Staff	
Assist. Prof. Raid Mahmood Faisal		Natural geography			Staff	
Assist. Prof. Mohammed Fakhr Aldin		Environmental Engineering			Staff	
Assistant Professor Dr. Abdulsattar Jubair		Soil chemistry			Staff	
Lecturer Dr. Mayada Ahmed Al Taii		Microbiology			Staff	
Lecturer Dr. Rasha Khalid		Environmental Engineering			Staff	
Lecturer Dr. Tahseen Ali		Hydrology			Staff	
Lecturer Diana Nooraldin		Biology			Staff	
Lecturer Muthaina Abdullah		Applied statistics			Staff	
Lecturer Roaa Mudhafar		Environmental Engineering			Staff	
Lecturer Dr. Hassan Hassan		Environmental Cost			Staff	
Lecturer Wissam Saeed		Phonetics			Staff	
Assistant Lecturer Hamsa Burhan		Materials science			Staff	
Assistant Lecturer Farah Khazaal		Hydraulics			Staff	
Assistant Lecturer Hasan Jamal Al Bazaz		Hydraulics			Staff	
Assistant Lecturer Ahmed		Irrigation			Staff	

Abdulrazaq						
Assistant Lecturer Raghad Hazim		Computer science			Staff	
Assistant Lecturer Lina Nawfal		Inorganic chemistry			Staff	
Assistant Lecturer Mustafa Amer		Environmental science			Staff	
Assistant Lecturer Hanan Riad		Civil Engineering			Staff	
Assistant Lecturer Muhanad Qasim		Soil			Staff	
Assistant Lecturer Mohammed Saadallah		Analytical Chemistry			Staff	
Assistant Lecturer Asmaa Muaid		Hydraulics			Staff	
Assistant Lecturer Basma Ghazwan		Remote sensing			Staff	
Assistant Lecturer Abeer Salih		physical chemistry			Staff	
Assistant Lecturer Zahraa Mohammed		Networks			Staff	
Assistant Lecturer Maan Hashim		Environmental Science			Staff	
Assistant Lecturer Burkan Mutasim		Constructions			Staff	
Assistant Lecturer Alaa Jasim		Inorganic chemistry			Staff	
Assistant Lecturer Omar Abduljabbar		Environmental science			Staff	
Assistant Lecturer Abdullah Abdulsattar		Environmental science			Staff	

Assist. Lecturer Ous Nawfal		Environmental science			Staff	
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Professional Development

Mentoring new faculty members

The lecturers' capabilities are developed through their participation in training courses specialized in methods of teaching held in the continuing education center, and directing the new lecturers to follow the modern methods followed in the educational system.

Professional development of faculty members

Setting clear plans showing the development courses to be completed by the teaching staff and according to the various specializations, as well as through the establishment of academic seminars at the department level delivered by the teaching staff of the department where and benefiting from accompanied discussions to increase new lecturers knowledge.

12. Acceptance Criterion

Working with the central admission system for morning studies.

13. The most important sources of information about the program

The college guide 2024-2025

14. Program Development Plan

The effectiveness of the study program is evaluated by observing student achievements, in addition to continuous responses and feedback from the teaching staff about the strengths and weaknesses of the program and ways to improve it for the purpose of continuously updating and developing it.

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
2025-2026	ENVT209	Fluids Mechanics I	Basic		*		*		*		*		*		*
	ENVT211	Environmental Statistics	Basic		*		*		*		*		*		*
	ENVT213	Soil Physics	Basic	*		*		*	*	*	*	*	*	*	
	ENVT210	Environmental Chemistry I	Basic	*					*		*		*		
	EnvTch31	Water supply and water treatment	Basic		*		*	*	*	*	*	*	*		
	EnvTch38	Industrial wastewater treatment	Basic		*		*	*	*	*	*	*	*		
	EnvTch44	Air pollution	Basic		*		*	*	*	*	*	*	*		
	EnvTch41	Wastewater treatment	Basic		*		*	*	*	*	*	*	*		

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

Course Description Form

1. Course Name:	
Analytical engineering	
2. Course Code:	
EnvTch34	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Tahseen Ali	
Email: tahssenali1967@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	To provide students with an appropriate amount of information and experience in the field of engineering analysis and methods for solving first- and second-order differential equations. To provide students with an appropriate amount of information and experience in the use and solution of numerical methods and how to extract unknown values from experimentally measured values.

9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in delivering this unit is to encourage students to participate in exercises, while simultaneously improving and expanding their critical thinking skills. This will be achieved through interactive lessons and educational programs, and by considering simple experiments that include sampling activities relevant to the students.
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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, monthly, or written exams, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Biochemistry	
2. Course Code:	
EnvTch37	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Mayada Ahmed	
Email: maysbio55@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	- Biochemistry is concerned with the chemical composition of the components of living cells and understanding the processes of biochemical reactions within them. - It studies the chemical nature of different types of nutrients and structural components of the cell and understands their biological functions within it.

	• It involves understanding the chemical composition of carbohydrates, proteins, nucleic acids, and lipids, the differences between them, and identifying the functions of each in the cells of a living organism.
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9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in delivering this unit is to encourage students to participate in exercises, while simultaneously improving and expanding their critical thinking skills. This will be achieved through interactive lessons and educational programs, and by considering simple experiments that include sampling activities relevant to the students.
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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, monthly, or written exams, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	

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

Course Description Form

1. Course Name:	
GIS	
2. Course Code:	
EnvTch33	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor Raad Mahmood Faisal	
Email:	
8. Course Objectives	
Course Objectives	Understanding the concept of coordinate systems and map projections. Understanding the fundamental concepts of spatial and descriptive data that form the basis of a Geographic Information System (GIS).

	Understanding the concepts of linear and raster data models and how to work with them. Producing and designing digital maps.
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9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in delivering this unit is to encourage students to participate in exercises, while simultaneously improving and expanding their critical thinking skills. This will be achieved through interactive lessons and educational programs, and by considering simple experiments that include sampling activities relevant to the students.
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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, monthly, or written exams, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references	

(scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Industrial Wastewater	
2. Course Code:	
EnvTch38	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Lect. Roao Youns	
Email:	
8. Course Objectives	
Course Objectives	Learn how to treat industrial wastewater so that it is in accordance with the required specifications
9. Teaching and Learning Strategies	
Strategy	
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
		That the student understands the lesson	An overview of industrial wastewater Industrial wastewater sources Physical and chemical properties of wastewater Industrial and most important indicators Biological characteristics A field visit Treatment levels: Pretreatment Primary processing Secondary processing Tertiary		

			treatment		
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, reportsetc					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Water and Wastewater Treatment and Disposal by Metcalf and Eddy		
Main references (sources)			-		
Recommended books and references (scientific journals, reports...)			Metcalf and Eddy, (2003) .Wastewater engineering –treatment and reuse (2003), CHP.13 Nemerow, N.L. Industrial Water Pollution; Addison-Wesley: Reading, MA, 1978. Besselièvre, E.B. The Treatment of Industrial Wastes; McGraw-Hill: New York, NY, 1969. Eckenfelder, W.W. Industrial Water Pollution Control; McGraw-Hill: New York, NY, 1989. Orhon D., Babuna, F.G., Karahan, O. Industrial Wastewater Treatment by Activated Sludge, 2009 عبد الله صغير، معالجة مياه الصرف الصناعي في الوطن العربي، الدار العربية للعلوم ناشرون، 2017		
Electronic References, Websites			https://ocw.mit.edu/courses/1-85-water-and-wastewater-treatment-engineering-spring-2006/pages/lecture-notes/		

Course Description Form

1. Course Name:	
Measurement techniques	
2. Course Code:	
EnvTch32	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name:	
Email:	
8. Course Objectives	
Course Objectives	- Students will learn how to use laboratory equipment and techniques. - They will learn about the measuring instruments used in practical scientific research. - They will learn how to calculate measurement errors, analyze the results of practical measurements, and discuss them scientifically and objectively.

9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in delivering this unit is to encourage students to participate in exercises, while simultaneously improving and expanding their critical thinking skills. This will be achieved through interactive lessons and educational programs, and by considering simple experiments that include sampling activities relevant to the students.
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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, monthly, or written exams, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Soil Pollution	
2. Course Code:	
EnvTch36	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Abdulsattar Jubair	
Email:	
8. Course Objectives	
Course Objectives	Identifying soil pollutants and some chemical properties and methods for estimating them after taking samples and making extracts, estimating cations and anions in the soil, how to analyze and classify the results, dealing with the soil laboratory, preparing samples for examination, and knowing the approved recommendations to reduce the environmental impact..

9. Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in presenting this course is for the student to know the pollutants that occur in the soil, their source, their effect on the soil, and the extent to which they can be identified through the use of soil laboratories, conducting chemical tests for them, presenting the practical results and comparing them with the approved classifications and their impact on the soil and the environmental aspect.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
		That the student understands the lesson	Soil pollution definition, introduction to environmental quality, sources and nature of soil pollution and its harmful effects Soil salinity sources of soil salinity		

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, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Soil Pollution. Origin, Monitoring & Remediation.2008. Ibrahim A. Mirsal
Main references (sources)	Soil Pollution: From Monitoring to Remediation 1st Edition.2017. Armando C. Duarte, Anabela Cachada, Teresa A.P. Rocha-Santos
Recommended books and references (scientific journals, reports...)	-
Electronic References, Websites	https://www.alibris.com/search/books/subject/Soil-pollution

Course Description Form

1. Course Name:	
Thermodynamics	
2. Course Code:	
EnvTch39	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Eman Al-Jajawady	
Email:	
8. Course Objectives	
Course Objectives	Thermodynamics :The objective of this course is to learn about - Concept temperature; the heat - basic theories in deriving the general law of gases, - Thermodynamic system (closed, open, or controlled the sound); - Thermodynamic and equilibrium properties. System Status, Status Diagram, Path and process different working methods of the zero ,first ,second ,three law of thermodynamics; familiarity with the three public sector in

	Thermodynamics
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9. Teaching and Learning Strategies

Strategy	1. Define terminology and become familiar with units concerned with basic concepts of the thermodynamics and Explain basic thermodynamic properties and units.. 2. .Define the meaning of the state of a working substance 3. Derive ,discuss and apply the first law and second of thermodynamics 4. Understand concepts of heat, work, and energy.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
		That the student understands the lesson	Introduction - Prescribed Books - Units. Important definitions - force - pressure and its types Temperature: its units, its conversions, and its measurement methods equilibrium, properties of p matter, and P diagram, Ideal		

			Boyle's Law Charles's Law equation of state		
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, reportsetc					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			- Peter Atkins, The Laws of Thermodynamics: A Very Short Introduction, Oxford, ISBN-10 9780199572199 - Atkins, Peter, de Paula, Julio, Keeler, James, Physical Chemistry, Published by Oxford University Press, 2018 ISBN:10: 0198817894 / ISBN 13: 9780198817895		
Main references (sources)					
Recommended books and references (scientific journals, reports...)			- Fundamentals of heat and mass transfer, by f.p. Incropera & d.p. De witt, John Wiley & Sons; 5th edition (2002) - Applications of thermodynamics" by: wood; addison-wesley - Basic thermodynamics: elements of energy systems" by: skrotzki; mcgraw-hill, copy 2018 - Introduction to Modern Thermodynamics, by Dilip Kondepudi, John Wiley & Sons Inc., 2008		
Electronic References, Websites					

Course Description Form

1. Course Name:	
Treatment of Solid Waste	
2. Course Code:	
EnvTch35	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Lect. Omar Khair Aldin	
Email:	
8. Course Objectives	
Course Objectives	The course aims to introduce the student to waste, its types, its harm the environment, and how to collect and dispose of it through sanitary landfilling or recycling important waste.
9. Teaching and Learning Strategies	

Strategy	The course is annual and is four hours a week. It is a theoretical subject and students are tested in the form of daily and monthly examinations and in a written form.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
		That the student understands the lesson			

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, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Introduction to environmental engineering and science / Gelbert M. Masters Solid wastes Engineering Principles and Management Issues/ George Tchobanglous , Hilary Theisen
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Water supply	
2. Course Code:	
EnvTch31	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor Mohammed Fakhr aldin	
Email: milhebi@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	1. The student will gain a skill in understanding the terminology of water treatment plants. 2. The student will acquire knowledge of water treatment plant unit design. 3. This semester covers the fundamental concepts of how to treat raw water and make it potable. 4. The student will gain skills in how water

	treatment plants work and operate. 5. The student will understand the types of water treatment: physical, chemical, and biological, through practical lessons.
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9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in delivering this unit is to encourage students to participate in exercises, while simultaneously improving and expanding their critical thinking skills. This will be achieved through interactive lessons and educational programs, and by considering simple experiments that include sampling activities relevant to the students.
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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, monthly, or written exams, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	

Electronic References, Websites	
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Course Description Form

1. Course Name:	
Air Pollution	
2. Course Code:	
EnvTch44	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor Mohammed Fakhri AlDin	
Email: milhebi@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	1. This course aims to identify prevalent air pollutants, their harmful effects, and methods for mitigating them. 2. This course aims to identify indoor air pollutants and their treatment. 3. This course aims to identify gaseous

	pollutants emitted by vehicles and methods for reducing them. 4. This course aims to identify greenhouse gases, their role in global warming, the resulting harm, and methods for mitigating the effects of climate change. 5. This course aims to identify the concentrations of pollutants emitted at point, line, and area levels. 6. This course aims to teach how to sample chimneys and calculate the concentration and types of emitted air pollutants.
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9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in delivering this unit is to encourage students to participate in exercises, while simultaneously improving and expanding their critical thinking skills. This will be achieved through interactive lessons and educational programs, and by considering simple experiments that include sampling activities relevant to the students.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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11. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily, monthly, or written exams, reportsetc					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)					
Main references (sources)					
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					

Course Description Form

1. Course Name:	
Environmental Costs	
2. Course Code:	
EnvTch48	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Hassan Hassan	
Email: dr.hassan@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	- Transforming the state's economic capital into sustainable capital... - Writing environmental reports and solutions for addressing environmental pollution at the lowest possible cost... - Activating the social responsibility of industrial companies

9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in delivering this unit is to encourage students to participate in exercises, while simultaneously improving and expanding their critical thinking skills. This will be achieved through interactive lessons and educational programs, and by considering simple experiments that include sampling activities relevant to the students.
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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, monthly, or written exams, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Irrigation and drainage	
2. Course Code:	
EnvTch43	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Mohammed Ali	
Email:	
8. Course Objectives	
Course Objectives	This course introduces students to the fundamentals of irrigation and drainage science, soil physical properties, irrigation water quality and its suitability for various uses, as well as studying traditional and modern irrigation techniques, calculating water requirements, managing water budgets, and the standards used to increase irrigation efficiency. It also explains the importance of drainage, its types, and

	land reclamation methods.
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9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in delivering this unit is to encourage students to participate in exercises, while simultaneously improving and expanding their critical thinking skills. This will be achieved through interactive lessons and educational programs, and by considering simple experiments that include sampling activities relevant to the students.
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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, monthly, or written exams, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
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Main references (sources)	
Recommended books and references (scientific journals, reports...)	secruoseR retaW dna noitagirrl awasA .L .G yb kcabrepaP gnireenignE
Electronic References, Websites	

Course Description Form

1. Course Name:	
Remote sensing	
2. Course Code:	
EnvTch46	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor Dr. Abdulrahman Ramzi	
Email: abdqubaa@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	- To provide an overview of the physical principles of remote sensing. - To introduce students to remote sensing data processing for analysis and interpretation, and to develop applications for Earth resource management and monitoring.

	• To develop specific skills in using spatial analysis and remote sensing software used in geographic research. • To explore how these concepts can be applied to a range of environmental applications.
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9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in delivering this unit is to encourage students to participate in exercises, while simultaneously improving and expanding their critical thinking skills. This will be achieved through interactive lessons and educational programs, and by considering simple experiments that include sampling activities relevant to the students.
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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, monthly, or written exams, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
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Main references (sources)	BOOK: Remote sensing and image interpretation Lillesand, Thomas M.; Kiefer, Ralph W.; Chipman, Jonathan W. 6th ed Chichester John Wiley [distributor] c2008
Recommended books and references (scientific journals, reports...)	BOOK: Introduction to the physics and techniques of remote sensing Elachi, Charles; Van Zyl, Jakob 2nd ed Hoboken, N.J. Wiley-Interscience Wiley series in remote sensing c2006
Electronic References, Websites	

Course Description Form

1. Course Name:	
Renewable energy	
2. Course Code:	
EnvTch49	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant lecturer Yaser Hazim	
Email: yasir.younis@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	- Understanding the concept of renewable energy. - Understanding the general framework of renewable energy. - Understanding the differences between renewable and non-renewable energy sources.

	• Understanding the advantages of using renewable energy. • Understanding the differences between the types of technologies used to utilize renewable energy sources. • Identifying the uses of renewable energy sources (agriculture, industry, transportation, etc.). • Developing innovative technologies for utilizing renewable energy sources.
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9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in delivering this unit is to encourage students to participate in exercises, while simultaneously improving and expanding their critical thinking skills. This will be achieved through interactive lessons and educational programs, and by considering simple experiments that include sampling activities relevant to the students.
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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, monthly, or written exams, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

Recommended books and references
(scientific journals, reports...)

John Twidell [رابط على الانترنت](#) Renewable energy resources

Electronic References, Websites

Course Description Form

1. Course Name:	
Urban planning	
2. Course Code:	
EnvTch45	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Hassan Hassan Email:	
8. Course Objectives	
Course Objectives	- To provide students with the appropriate amount of information and experience in the field of urban planning - In a way that contributes to their acquisition of practical experience and academic preparation for professional life

	• And helps them become familiar with the basic principles of urban planning approaches.
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9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in delivering this unit is to encourage students to participate in exercises, while simultaneously improving and expanding their critical thinking skills. This will be achieved through interactive lessons and educational programs, and by considering simple experiments that include sampling activities relevant to the students.
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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, monthly, or written exams, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	

Electronic References, Websites	
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Course Description Form

1. Course Name:	
Wastewater treatment	
2. Course Code:	
EnvTch41	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant professor Dr. Rasha Khalid	
Email:	
8. Course Objectives	
Course Objectives	- Introducing the student to the types of wastewater. - This course covers the fundamentals of wastewater treatment and management. - Introducing the student to the characteristics of wastewater, especially municipal wastewater.

	- How is this waste treated? - How are wastewater treatment plants designed? - How can wastewater be disposed of safely in the environment? - Developing problem-solving skills and understanding wastewater applications. - Performing design calculations for treatment plants.
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9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in delivering this unit is to encourage students to participate in exercises, while simultaneously improving and expanding their critical thinking skills. This will be achieved through interactive lessons and educational programs, and by considering simple experiments that include sampling activities relevant to the students.
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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, monthly, or written exams, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

Water and Wastewater Treatment and Disposal by Metcalf and Eddy

Recommended books and references
(scientific journals, reports...)

Water Supply and Sewerage System by Mc Ghee and Steel

Electronic References, Websites

<https://ocw.mit.edu/courses/1-85-water-and-wastewater-treatment-engineering-spring-2006/pages/lecture-notes/>

Course Description Form

1. Course Name:	
Water reuse	
2. Course Code:	
EnvTch47	
3. Semester / Year:	
2025-2026	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant lecturer Omar K. Aldeen	
Email: omar.k.aldeen@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	Understanding the importance of water reuse for agricultural and industrial purposes, groundwater recharge, and various other uses, and understanding how to treat wastewater to make it suitable for other uses according to the required specifications for the intended purpose.
9. Teaching and Learning Strategies	

Strategy	The main strategy to be adopted in delivering this unit is to encourage students to participate in exercises, while simultaneously improving and expanding their critical thinking skills. This will be achieved through interactive lessons and educational programs, and by considering simple experiments that include sampling activities relevant to the students.
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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, monthly, or written exams, reportsetc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	-Metcalf and Eddy, (2003) .Wastewater engineering –treatment and reuse (2003), CHP.13 - -M et al (2010), Urban and Industrial Water Treatment, - -Reuse And Recycling – Part A - Educational Module 6.2: Industrial Water Reuse and Recycling – Wastewater -Treatment and Recycling Technologies Smith, chp.6, Sustainable Water Solutions Climate Change Adaptation

Recommended books and references (scientific journals, reports...)	-DAVIS, R., HIRJI, R., (2005) WATER RESOURCES AND ENVIRONMENT TECHNICAL NOTE F.3: Wastewater Reuse, -The International Bank for Reconstruction and Development/THE WORLD BANK 1818 H Street, N.W., Washington, D.C. 20433, U.S.A
Electronic References, Websites	