

# Academic Program and Course Description Guide

University Name: .....University of Mosul.....

Faculty/Institute: .....College of Environmental Science and Technologies.....

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

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

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

Academic System:.....Annual .....

Description Preparation Date: 1-12-2022

File CompletionDate: 1-12-2022

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Head of DepartmentName:

Date:

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Approval of the Dean

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رئيس قسم ضمان الجودة وأداء الجامعة  
٢٠٢٢/١٢/٠١

## **1. Program Vision**

The Department of Environmental Technology is considered one of the modern and rare departments. The department includes in its aspects a link between environmental technical aspects and environmental aspects. The bachelor's program provides students with a basic understanding of the basics of environmental science, in addition to a broad background in related fields.

## **2. Program Mission**

Conveying all information related to environmental science during the four years of preliminary studies, as shown below:

First Year – During your first year of study, you begin to establish a strong foundation in the natural sciences, understand the structure and function of the environment, and apply environmental thinking to all aspects of life.

Second Year – The second study is a year dedicated to enhancing general technical skills and acquiring skills in environmental technologies and management practices. You will have the competence to assist under supervision in monitoring and managing projects in environmental technology.

Third Year – During the third academic year, you continue to deepen your skills in dealing with environmental problems, finding appropriate solutions, and building an efficient personality in project work and practical environmental tasks.

Fourth Year – The fourth year of study is a time to develop your proficiency in selected modules and prepare yourself for the challenges of practical life.

### **3. Program Objectives**

The department aims to prepare environmental–technical cadres concerned with environmental affairs in all its components and works to graduate competent cadres specialized in the field of environmental technology capable of diagnosing environmental problems and trying to develop appropriate solutions for them by linking the theoretical, laboratory and practical aspects of knowledge that the student receives over the years and stages of study that he receives. It extends for four years. The student who graduates from the department is awarded a bachelor’s degree in the field of environmental science and technology and is qualified to work in state governmental departments and institutions and the mixed and private sectors concerned with environmental and health affairs and related departments.

### **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	<b>practical</b>
/ 2024-2025 second	EnvTch21	Mathematics	theoretical	2
	EnvTch22	Statistics	– theoretical practical	2 2
	EnvTch23	Environmental chemistry	– theoretical practical	2 2
	EnvTch24	Hydrology	– theoretical practical	2 2
	EnvTch25	Fluids mechanics	– theoretical practical	2 2
	EnvTch26	Survey	– theoretical	2

			practical	2
	<b>EnvTch27</b>	Environmental Science	theoretical	2
	<b>EnvTch28</b>	Organic chemistry	theoretical practical	2 2
	<b>EnvTch29</b>	Water quality	– theoretical practical	2 2
	<b>EnvTch210</b>	The crimes of the Baath regime in Iraq	theoretical	2
third / 2024–2025	<b>EnvTch31</b>	Water treatment	theoretical practical	2 2
	<b>EnvTch32</b>	Measurement technologies	theoretical	2
	<b>EnvTch33</b>	GIS	theoretical practical	2 2
	<b>EnvTch34</b>	Engineering analysis	theoretical	2
	<b>EnvTch35</b>	Solid waste treatment	theoretical	2
	<b>EnvTch36</b>	Soil pollution	theoretical practical	2 2
	<b>EnvTch37</b>	Biochemistry	theoretical practical	2 2
	<b>EnvTch38</b>	Industrial waste management	theoretical	2
	<b>EnvTch39</b>	Thermodynamics	theoretical	2
fourth / 2024–2025	<b>EnvTch41</b>	Wastewater treatment	theoretical practical	2 2
	<b>EnvTch42</b>	Environmental regulations	theoretical	2
	<b>EnvTch43</b>	Irrigation	theoretical	2
	<b>EnvTch44</b>	Air pollution	theoretical	2
	<b>EnvTch45</b>	Urban planning	theoretical	2
	<b>EnvTch46</b>	Remote sensing	theoretical practical	2 2
	<b>EnvTch47</b>	Water reuse	theoretical	2
	<b>EnvTch48</b>	Environmental cost and management	theoretical	2

	<b>EnvTch49</b>	Renewable energy	theoretical	2
	<b>EnvTch410</b>	Graduation project		2

<b>8. Expected learning outcomes of the program</b>	
<b>Knowledge</b>	
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
<b>Skills</b>	
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
<b>Ethics</b>	
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.

<b>9. Teaching and Learning Strategies</b>
1- Explaining the scientific material to students in detail in classrooms, scientific laboratories, and electronic classes
2- Students' participation in solving problems and exercises
3- Discussion and dialogue about vocabulary related to the topic

<b>10. Evaluation methods</b>
Conducting daily, quarterly and annual examinations, in addition to conducting practical examinations in laboratories, with the use of Questionnaire form at the end of each academic year.

## 11. Faculty

### Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Assist. Prof. Dr. Ayad Fadeel		Environmental Engineering			Staff	
Assistant Lecturer Abdullah Abdulsattar		Environmental science			Staff	
Assist. Prof. Dr. Eman Abdulmunaim		physical chemistry			Staff	
Assist. Prof. Raid Mahmood Faisal		Natural geography			Staff	
Assist. Prof. Mohammed Fakhr Aldin		Environmental Engineering			Staff	
Lecturer Dr. Abdulsattar Jubair		Soil chemistry			Staff	
Lecturer Dr. Ali Basheer		Nuclear physics			Staff	
Lecturer Dr. Rasha Khalid		Environmental Engineering			Staff	

Lecturer Dr. Tahseen Ali		Hydrology			<b>Staff</b>	
Lecturer Diana Nooraldin		Biology			<b>Staff</b>	
Lecturer Muthaina Abdullah		Applied statistics			<b>Staff</b>	
Lecturer Roaa Mudhafar		Environmental Engineering			<b>Staff</b>	
Lecturer Dr. Hassan Hassan		Environmental Cost			<b>Staff</b>	
Lecturer Wisam Saeed		Phonetics			<b>Staff</b>	
Assist. Lecturer Hamsa Burhan		Materials science			<b>Staff</b>	
Assist. Lecturer Hanaa Adalat		Financial			<b>Staff</b>	
Assist. Lecturer Omar Khair Aldin		Soil mechanics			<b>Staff</b>	
Assist. Lecturer Farah Khazaal		Hydraulics			<b>Staff</b>	
Assist. Lecturer Ahmed Abdulrazaq		Irrigation			<b>Staff</b>	
Assist. Lecturer Raghad Hazim		Computer science			<b>Staff</b>	
Assist. Lecturer Lina		Inorganic			<b>Staff</b>	



Nawfal		chemistry				
Assist. Lecturer Mustafa Amer		Environmental science			<b>Staff</b>	
Assist. Lecturer Hanan Riad		Civil Engineering			<b>Staff</b>	
Assist. Lecturer Muhanad Qasim		Soil			<b>Staff</b>	
Assist. Lecturer Mohammed Saadallah		Analytical Chemistry			<b>Staff</b>	
Assist. Lecturer Asmaa Muaid		Hydraulics			<b>Staff</b>	
Assist. Lecturer Basma Ghazwan		Remote sensing			<b>Staff</b>	
Assist. Lecturer Abeer Salih		physical chemistry			<b>Staff</b>	
Assist. Lecturer Zahraa Mohammed		Networks			<b>Staff</b>	
Assist. Lecturer Maan Hashim		Environmental Science			<b>Staff</b>	
Assist. Lecturer Burkan Mutasim		Constructions			<b>Staff</b>	
Assist. Lecturer Alaa Jasim		Inorganic chemistry			<b>Staff</b>	
Assist. Lecturer Omar		Environmental			<b>Staff</b>	

Abduljabbar		science				
Assist. Lecturer Mohammed Abdulrazaq		Environmental science			<b>Staff</b>	
Assist. Lecturer Ous Nawfal		Environmental science			<b>Staff</b>	

## 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**

**Program Skills Outline**

The college guide 2017–2018

**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.

				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
2024-2025	EnvTch23	Environmental chemistry	Basic		*		*		*		*		*		*
	EnvTch28	Organic chemistry	Basic		*		*		*		*		*		*
	EnvTch27	Environmental science	Basic	*		*		*	*	*	*	*	*	*	
	EnvTch24	Hydrology	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:	
Treatment of Solid Waste	
2. Course Code:	
EnvTch35	
3. Semester / Year:	
2022	
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	
<b>Course Objectives</b>	The course aims to introduce the student to waste, its types, harm to the environment, and how to collect it and dispose of it through sanitary landfilling and recycling important waste.
9. Teaching and Learning Strategies	

<b>Strategy</b>	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

<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
		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, reports ....etc

#### 12. Learning and Teaching Resources

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

## Course Description Form

13. Course Name:	
Industrial Wastewater	
14. Course Code:	
EnvTch38	
15. Semester / Year:	
2022	
16. Description Preparation Date:	
17. Available Attendance Forms:	
18. Number of Credit Hours (Total) / Number of Units (Total)	
19. Course administrator's name (mention all, if more than one name)	
Name: Lect. Roao Youns	
Email:	
20. Course Objectives	
<b>Course Objectives</b>	Learn how to treat industrial wastewater so that it is in accordance with the required specifications
21. Teaching and Learning Strategies	
<b>Strategy</b>	

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



			processing  Tertiary treatment		
23. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, dailyoral, monthly, or written exams, reports ....etc					
24. 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...)			<p>Metcalf and Eddy, (2003) .Wastewater engineering –treatment and reuse (2003), CHP.13</p> <p>Nemerow, N.L. Industrial Water Pollution; Addison-Wesley: Reading, MA, 1978.</p> <p>Besselièvre, E.B. The Treatment of Industrial Wastes; McGraw-Hill: New York, NY, 1969.</p> <p>Eckenfelder, W.W. Industrial Water Pollution Control; McGraw-Hill: New York, NY, 1989.</p> <p>Orhon D., Babuna, F.G., Karahan, O. Industrial Wastewater Treatment by Activated Sludge, 2009</p> <p>عبد الله صغير، معالجة مياه الصرف الصناعي في الوطن العربي، الدار العربية للعلوم ناشرون، 2017</p>		
Electronic References, Websites			<a href="https://ocw.mit.edu/courses/1-85-water-and-wastewater-treatment-engineering-spring-2006/pages/lecture-notes/">https://ocw.mit.edu/courses/1-85-water-and-wastewater-treatment-engineering-spring-2006/pages/lecture-notes/</a>		

## Course Description Form

25. Course Name:	
Thermodynamics	
26. Course Code:	
EnvTch39	
27. Semester / Year:	
2022	
28. Description Preparation Date:	
29. Available Attendance Forms:	
30. Number of Credit Hours (Total) / Number of Units (Total)	
31. Course administrator's name (mention all, if more than one name)	
Name: Dr. Eman Al-Jajawady	
Email:	
32. Course Objectives	
<b>Course Objectives</b>	<b>Thermodynamics :</b> The objective of this course is to learn about <ul style="list-style-type: none"> <li>Concept temperature; the heat</li> <li>basic theories in deriving the general law of gases,</li> <li>Thermodynamic system (closed, open, or controlled the sound);</li> <li>Thermodynamic and equilibrium properties.</li> </ul>

	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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### 33. Teaching and Learning Strategies

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

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
		That the student understands the lesson	<p>Introduction - Prescribed Books - Units.</p> <p>Important definitions - force - pressure and its types Temperature: its units,</p> <p>its conversions, and its measurement methods</p>		

			equilibrium, properties of p matter, and P diagram, Ideal Boyle's Law Charles's I equation of state		
<b>35. Course Evaluation</b>					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ....etc					
<b>36. Learning and Teaching Resources</b>					
Required textbooks (curricular books, if any)			<p>- Peter Atkins, The Laws of Thermodynamics: A Very Short Introduction, Oxford, ISBN-10 9780199572199</p> <p>- Atkins, Peter, de Paula, Julio, Keeler, James, Physical Chemistry, Published by Oxford University Press, 2018</p> <p>ISBN:10: 0198817894 / ISBN 13: 9780198817895</p>		
Main references (sources)					
Recommended books and references (scientific journals, reports...)			<p>- Fundamentals of heat and mass transfer, by f.p. Incropera &amp; d.p. De witt, John Wiley &amp; Sons; 5th edition (2002)</p> <p>- Applications of thermodynamics" by: wood; addison-wesley</p> <p>- Basic thermodynamics: elements of energy systems" by: skrotzki; mcgraw-hill, copy 2018</p> <p>- Introduction to Modern Thermodynamics, by Dilip Kondepudi, John Wiley &amp; Sons Inc., 2008</p>		
Electronic References, Websites					

## Course Description Form

37. Course Name:	
Soil Pollution	
38. Course Code:	
EnvTch36	
39. Semester / Year:	
2022	
40. Description Preparation Date:	
41. Available Attendance Forms:	
42. Number of Credit Hours (Total) / Number of Units (Total)	
43. Course administrator's name (mention all, if more than one name)	
Name: Dr. Abdulsattar Jubair	
Email:	
44. Course Objectives	
<b>Course Objectives</b>	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..
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#### 45. Teaching and Learning Strategies

<b>Strategy</b>	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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#### 46. 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 s		

			salinity		
47. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ....etc					
48. 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			<a href="https://www.alibris.com/search/books/subject/Soil-pollution">https://www.alibris.com/search/books/subject/Soil-pollution</a>		