

University of Mosul



Bachelor's Degree (B.Sc.) – Environmental Engineering

3rd cycle



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1. Overview

This catalogue is about the courses (modules) given by the program of Environmental Engineering to gain the Bachelor of Science degree. The program delivers (53) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

2. Undergraduate Courses 2025-2026

First Level

1st Semester

Module 1

Code	Course/Module Title	ECTS	Semester
ENV111	Calculus 1	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/0/0/2	78	72
Description			
This course introduces the students to the main topics of calculus. The course will cover Prerequisites for calculus, Limits, Continuity, and Differentiation (methods and applications), Integration, Applications of Definite Integrals, The Calculus of Transcendental Function, Techniques of Integration. At the end of the course, students will have a broad knowledge of the basic concepts, techniques and applications of differential and integral calculus. This will be achieved through theoretical lectures, tutorials and homework.			

Module 2

Code	Course/Module Title	ECTS	Semester
ENV112	Statics	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/0/0/2	78	72
Description			

Statics focuses on the study of stationary bodies and the balance of forces and moments acting upon them. The objective of the course is to equip students with the knowledge and skills necessary to analyze and design structures and static objects to ensure their stability and strength. The course covers Newton's laws for static conditions, with an emphasis on equilibrium laws, force and moment analysis, identifying pressure and shear points, and studying the types of stress and strain experienced by materials in static states. It also includes practical applications through case studies and structural analysis, aiming to prepare students to perform accurate analyses and create safe, suitable designs for engineering and structural purposes.

Module 3

Code	Course/Module Title	ECTS	Semester
ENV113	Engineering Drawing	7	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
0	0/6/0/0	93	82
Description			
The aim of this course is to help the students to use the technical drawing and performs drawing exercises with ruler, compass, T-square. make the student able to draw circles with straight lines, arcs and polygon. learns and applies dimensioning rules. knows the properties of cross section view and carry out the perspective drawings due to views. This course has several components that include studying lectures, tutorial, discussion, homework, and e-learning platforms. The course will be taught in English, and all compulsory assignments have to be submitted within the deadlines to be admitted to the exam.			

Module 4

Code	Course/Module Title	ECTS	Semester
ENV114	Environmental Thermodynamics	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/1	48	52
Description			
The Environmental Thermodynamics course addresses the fundamental principles of thermodynamics and their applications to various environmental systems. The course aims to acquaint students with how energy is transferred and transformed within the environment, and to understand the laws governing these processes and their impact on different environmental phenomena. The course includes the study of the two fundamental laws of thermodynamics: the first law concerning energy conservation, and the second law related to system entropy. It also covers thermal and physical processes in the environment by examining environmental applications of thermodynamics such as energy balance analysis and chemical energy			

transformations in the decomposition of organic materials and biotic environmental reactions. Using thermodynamic models, students learn how to assess energy dynamics within ecosystems, contributing to a deeper understanding of the effects of natural changes and human activities on the environment.

Module 5

Code	Course/Module Title	ECTS	Semester
ENV115	Statistics	3	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	42
Description			
There is a need to know how to deal with a large amount of data. The objectives of this module is how to generate informative data and how to extract information from data and to explain the valuable methods to present these data and extract the conclusions from them. Additionally, the module include how to describe the data in a clear manner.			

Module 6

Code	Course/Module Title	ECTS	Semester
UOM1011	Arabic Language 1	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	33	17
Description			
The study aims to introduce the student to the main topics of the Arabic language. The semester will cover basic requirements in Arabic language definitions, grammatical rules for tenses, developing grammatical abilities in the singular, plural, and forbidden forms of inventory, in addition to rhetoric and application			

Module 7

Code	Course/Module Title	ECTS	Semester
UOM1040	Democracy and Human Rights	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	33	17
Description			
The course aims to expand the student's awareness of democracy and human rights, familiarity with the basic rights that an individual must enjoy, and the ability to distinguish between rights and duties, as well as introducing the student to the concept of human rights, the historical development of human rights and its religious sources, and the rights and freedoms stipulated in the Iraqi constitution.			

First Level

2nd Semester

Module 1

Code	Course/Module Title	ECTS	Semester
ENV121	Calculus 2	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/0/0/2	78	72
Description			
The aim of this course is to introduce the students to the main topics of Calculus The course will cover Integration, Applications of Definite Integrals, The Calculus of Transcendental Function, Techniques of Integration and Polar Coordinates. At the end of the course, students will have a broad knowledge of the basic concepts of integration, techniques of integration, applications of definite integrals, and Polar coordinates. This will be achieved through theoretical lectures, tutorials and homework.			

Module 2

Code	Course/Module Title	ECTS	Semester
ENV122	Dynamics	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/1	48	77
Description			
The course aims to teach the basic concepts and system of forces to enable students to understand the relationship between physical and kinetic processes and to develop the skills necessary to use the basic principles of mechanics in engineering applications.			

Module 3

Semester	ECTS	Course/Module Title	Code
2	4	Principles of Environmental Engineering	ENV123
USWL (hr/sem)	SSWL (hr/sem)	Lect/Lab./Prac./Tutor	Class (hr/w)
37	63	2/0/0/0	2
Description			
The aim of the course is to introduce the student to the main principles of environmental engineering and everything related to environmental pollution: an introduction to the environment, environmental pollution, and the factors that lead to environmental deterioration. Types of pollution (water pollution, air pollution, noise pollution, thermal pollution, water pollution, water sources and their characteristics, Chemical and physical properties of water, water quality, surface water pollution and its sources, groundwater pollution and its sources, treatment of water for drinking purposes with a table of units and a brief explanation of each unit, Treatment and disposal of waste water, characteristics of waste water, treatment objective, plan of wastewater treatment units Treatment and disposal of waste water, characteristics of waste water, treatment goal plan of waste water treatment units, with site visits being conducted to identify the treatment units and environmental projects established and under implementation.			

Module 4

Code	Course/Module Title	ECTS	Semester
ENV124	Geology	3	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	33	42
Description			
The course aims to introduce students to the principles of environmental geology and the study of the Earth, its materials, and their physical, chemical, and biological properties both internally and externally, as well as its history. It covers the environment and everything surrounding living organisms that affects them. Environmental geology.			

Module5

Code	Course/Module Title	ECTS	Semester
ENV125	Drawing by Computer	7	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
0	0/4/0/0	63	112

Description
The objective of this course is to train students on the AutoCAD software, familiarize them with the software's features, teach them the commands necessary for drawing, and explain how to activate and print.

Module 6

Module 3			
Code	Course/Module Title	ECTS	Semester
UOM1031	Computer 1	3	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
1	0/2/0/0	48	27
Description			
The module aim is to prepare student to deal with computers, In addition to teach them the fundamentals of computers and its components. Furthermore, learning how to use two of Microsoft Office applications (Word & Excel).			

Module7

Code	Course/Module Title	ECTS	Semester
UOM1021	English Language 1	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	33	17
Description			
The aim of the course is to comprehend the fundamental principles of the English language and explore the foundational concepts essential for learning the key principles of English grammar and expanding English vocabulary. Establish a solid foundation for proficient English writing and speaking. Gain a comprehensive understanding of constructing grammatically accurate English sentences			

Second Level

1st Semester

Module 1

Code	Course/Module Title	ECTS	Semester
ENV211	Mathematics	6	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/0/0/2	78	72
Description			
This course provides students with the fundamentals for plane analytic geometry (Circle, parabola, Ellipse, Hyperbola), partial derivatives for Functions of two or more variables, Hyperbolic function, Catenary, Multiple Integration and Differential equations (1st order 1st degree).			

Module 2

Code	Course/Module Title	ECTS	Semester
ENV212	Fluids Mechanics	6	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/2/0/2	93	57
Description			
Fluid mechanics deals with the fluid while it is in its static and motion conditions, as the curriculum deals with the basic principles and laws derived on the basis of these principles that govern the fluid in each case. The focus is on the fluid, which is in its liquid state, especially water, as the environmental engineer deals with water in various engineering aspects in the applied field. The application of the laws is clarified through various mathematical examples with their illustrations, after the mathematical formulas for these laws are derived. The curriculum also includes deepening the understanding and assimilation of the theoretical side through practical application by conducting laboratory experiments on a number of the main topics of the subject.			

Module 3

Code	Course/Module Title	ECTS	Semester
ENV213	Chemistry	4	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/2/0/0	63	37
Description			

The aim of this course is to introduce the students to the area of environmental chemistry. The course will cover the chemistry of the air, water and soil and examine the environmental fate of anthropogenic chemicals released into the environment. This course employs the chemical principles to be used to explain and predict reactions, partitioning, and concentrations of anthropogenic chemicals in different environmental compartments. The course also emphasizes the impact of common pollutants on humans, animals, plants and the nonliving parts of the earth. Then, it will consider possible green chemistry, engineering and societal approaches to mitigating deleterious effects of pollution. The course will be beneficial to chemists, chemical and environmental engineers, and environmental scientists.

Module 4

Code	Course/Module Title	ECTS	Semester
ENV214	Engineering Surveying	5	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/3/0/0	93	32
Description			
This course aims to introduce the students to the category of Engineering surveying . Introductory and definitions, which are used in plane surveying: Instruments for measuring distance obstacles in measurements Instruments for setting out right angles, Tape corrections. Leveling, Areas, and volumes. Computation of volumes. The Theodolite and Traverse surveying. Tachometry. Curves. Total instrument station, GPS field procedure. This will be achieved through descriptive lectures.			

Module 5

Code	Course/Module Title	ECTS	Semester
ENV215	Strength of Materials	4	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/1	48	52
Description			
This course is a study of the effect of external loads on structural elements and the behavior of the elements under these loads. Determination of different types of stresses, strains and the relation between them, calculation of stresses in thin-walled pressure vessels, drawing shear and bending-moment diagrams of beams, calculation of bending and shear stresses in beams, and calculating deflections in beams using double integration method are explained in details. The course aims to expand the student's understanding of the structural elements' behavior under different loads- that is essential to design and evaluate any structural member.			

Module 6

Code	Course/Module Title	ECTS	Semester
ENV216	Engineering Hydrology	3	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	33	42
Description			
The course will cover discussion of the basic physical principles of the water cycle, different climate factors and components (evaporation, condensation, precipitation, runoff, stream flow). At the end of the course the students will have a working knowledge for estimating Precipitation in different methods as well as Abstraction from Precipitation, Stream flow Measurement, Run-Off, Hydrograph, and Flood Routing and have the skills of analytical skills (analyze data collected in the field and examine the results) and Communication skills (prepare detailed reports that document their research methods and findings). This will be achieved through descriptive lectures with Preparing hydrological reporting and supervised tutorials.			

Module 7

Code	Course/Module Title	ECTS	Semester
UOM201	Crimes of Baath Regime	2	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	33	17
Description			
The aim of the course is to educating students about the crimes committed by the Baath regime in Iraq. Directing students to familiarity and knowledge of crimes. Educating students about seriousness of crimes			

Module 8

Code	Course/Module Title	ECTS	Semester
UOM2022	English Language 2	2	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	33	17
Description			
The aim of the course is to foster the development of problem-solving skills, with a particular emphasis on speaking, reading, writing, and listening, while also gaining a comprehensive understanding of the English language as a foreign language through the utilization of various techniques.			

Second Level

2nd Semester

Module 1

Code	Course/Module Title	ECTS	Semester
ENV221	Water Quality Engineering	7	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/2/0/0	78	97
Description			
The aim of this course is to introduce the students to basic concepts on Water Quality Engineering. The course will cover water resources, principal sources of water pollution, Water Quality Management (rivers, lakes and groundwater), Water quality criteria and standards, fate of pollutant in the environment, Modeling of water quality in natural systems. The Lab part: the main goal of this part is to equip students with the expertise and skills necessary for monitoring water quality and analyzing it quantitatively. At the end of the course, students will learn how to analyze different water samples and will acquire the necessary expertise and skills to monitor and analyze water quality. This will be achieved through lectures, laboratories and tutorials.			

Module 2

Code	Course/Module Title	ECTS	Semester
ENV222	Concrete and Building Technology	6	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/2/0/0	78	72
Description			
This course is aimed principally at university and college students who wish to understand the concrete for the purpose of using it in professional practice. The students must take sufficient care to ensure the selection of correct ingredients, for concrete making to achieve a suitable mix, and to obtain a technically sound execution of concrete works. They must also have an intimate knowledge of the interaction between the different components that go into making concrete, whether in a fresh state or in a hardened state. Moreover, this course gives principles of building systems, construction methods and techniques, starting from the idea, feasibility study, preparation of plans, methods of implementation, and excavation. Besides that, the equipment and methods of transporting and compacting of concrete, and an explanation of masonry units with their properties and methods of construction with them. The course covers the structural as well as finish works.			

Module 3

Code	Course/Module Title	ECTS	Semester
ENV223	Survey Applications and GIS	6	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/3/0/0	78	72
Description			
This course provides an overview of the physical principles of remote sensing, develops skills in spatial analysis and remote sensing software, and introduces remote sensing data processing with applications for land resource management and monitoring. Students will learn to apply these concepts to environmental applications, create databases, perform automated digitization of satellite imagery and spatial analysis, and create environmental maps of pollution sites with descriptive terrestrial data. The course also trains students in using total station devices for surveying and map projection.			

Module 4

Code	Course/Module Title	ECTS	Semester
ENV224	Microbiology	6	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/2/0/0	63	87
Description			
To enhance the understanding of microbial function in engineered systems, initially students are supposed to learn how to deal with different types of microorganisms and it's useful in designing wastewater and water treatment plants. Also, microorganisms play an important role in the protection of humans, animals, plants, air, soil, and engineering systems from chemical or biological pollution, deterioration, and corrosion, and in the restoration of polluted and degraded environments.			

Module 5

Code	Course/Module Title	ECTS	Semester
UOM2012	Arabic Language 2	2	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	33	17

Description
The course aims to introduce the student to the main topics of the Arabic language subject. The semester will cover the basic requirements including definitions of the Arabic language, grammatical rules for tenses, development of grammatical skills in singular, plural, and jussive forms, in addition to rhetoric and application

Module 6

Code	Course/Module Title	ECTS	Semester
UOM2032	Computer 2	3	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/2/0/0	63	12
Description			
The main strategy that will be adopted in delivering this module is to encourage students' participation in the Lab activities, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, laboratory and by considering type of external search involving some of computer technology that are interesting to the students.			

Third Level

1st Semester

Module 1

Code	Course/Module Title	ECTS	Semester
ENV311	Principles of Air pollution	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/0/0/0	48	77
Description			
The aim of this course is to define the atmosphere and air pollution effects. The course will cover classification of air pollutants, their sources and concentrations, Relationship between air pollution and meteorology, mathematical models of dispersion (Gaussian Plume Dispersion model, point source, line source, area (box) model). Furthermore, indoor air quality model, its sources and emission modeling (radon model). Upon completion of this course student will be able to: Knowing the air pollution origins, types, causes, dispersion, and modeling.			

Module 2

Code	Course/Module Title	ECTS	Semester
ENV312	Water Supply Networks	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/0/0/1	63	62
Description			
The course aim to describe the main components of water supply network system including water pipes network, pump station, and service storage tanks, also it describes all parameters that correlate with network such as valves, pipe materials, loads exerted on pipes. The course covers the methods that used to analysis and design of the main components of water supply network system, and learns the necessary principles of network maintenance and rehabilitation.			

Module 3

Code	Course/Module Title	ECTS	Semester
ENV313	Solid Waste Engineering	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/0/0/1	63	62
Description			

The course would cover-general introduction including definition of municipal solid waste; legal issues and requirements for solid waste management; sampling and characterization of solid waste; analysis of solid waste constituents; health and environmental issues related to solid waste management; steps in solid waste management including solid waste reduction at source, collection techniques, materials and resource recovery/recycling, transport, optimization of solid waste transport, treatment and disposal techniques (composting, incineration, refuse derived fuels, landfilling).

Module 4

Code	Course/Module Title	ECTS	Semester
ENV314	Unit Operations & Processes	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/2/0/1	78	47
Description			
This course aims to introduce the students to the area of wastewater treatment process. The course will cover fundamentals of physical, chemical, biological wastewater treatment process. At the end of the course the students will have a knowledge of the wastewater treatment process and operation that qualify them to perform a complete wastewater treatment process.			

Module 5

Code	Course/Module Title	ECTS	Semester
ENV315	Sustainability Engineering	4	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	33	67
Description			
This course aims to introduce the students to the sustainability concept, and the principles of sustainable development. Also how they can exchange the different activities within sustainability concept !! Also this course deals with the environmental impact of the concrete from a variety of viewpoints: the concrete constituents themselves, the application of wastes and by-products, and the use of natural materials of low environmental impact. It thus provides a sound basis for developing and application of ecologically friendly concretes. Another purpose of this course is to make the students aware of the technical possibilities for recycling of demolished concrete and masonry. This course as well exposes students to a broader range of types of new and renewable energies as sun energy (photocells, heating, salt lagoon), wind energy, waterfalls energy, gravity energy, the practical methods to use.			

Module 6

Code	Course/Module Title	ECTS	Semester
ENV316	Engineering safety and ethics	3	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/1/0	48	27
Description			
This course aims to introduce engineers to the concept of public safety and its role in the system of: Human development and public life, public safety and its relationship to public health and occupational safety, The objectives, laws, and regulations of public safety, Understanding the outcomes of work in public safety			

Module 7

Code	Course/Module Title	ECTS	Semester
ENV317	Differential Equation	3	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	33	42
Description			
Differential equations have wide applications in various engineering and science disciplines. In general, modelling variations of a physical quantity, such as temperature, pressure, displacement, velocity, stress, strain, or the concentration of a pollutant, with respect to time t or location (x, y, z) , or both, would require differential equations. Similarly, studying the variation of a physical quantity with respect to other physical quantities would lead to differential equations. Engineers need to model physical problems using mathematical equations and then solve them to study the underlying concerns			

Third Level

2nd t Semester

Module 1

Code	Course/Module Title	ECTS	Semester
ENV321	Hydraulics Applications	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
4	0/0/0/0	63	62
Description			
The aim of this course is to introduce the students to the applications of hydraulics in environmental engineering. The course will cover the Open channel flow, non-uniform flow in open channels, Flow measurement and hydraulic control points, Pressure Surges "Water Hammer", and similarity, At the end of the course the students will be able to use the hydraulic principles to solve problems associated with environmental engineering and design of unit processes for water and wastewater treatment plants.			

Module 2

Code	Course/Module Title	ECTS	Semester
ENV322	Sewer Networks	6	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/0/0/1	63	87
Description			
The course aim to describe the quantity and quality properties of wastewater and storm water, and learns the engineering methods used in the analysis and design of sanitary sewers networks, storm sewers networks, and plumbing networks. The course covers describing the main appurtenances of sewers networks system in addition to domestic plumbing system.			

Module 3

Code	Course/Module Title	ECTS	Semester
ENV323	Noise Pollution	4	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	33	67
Description			

The student will be able to be familiar with basic information regarding noise pollution to allow proper assessment of impacts arising from the various projects or activities and devising appropriate mitigation or control measures. In this respect, the Noise Pollution course covers sources, characteristics and effects of industrial, transportation and urban noise; measurement, assessment and evaluation of noise; control of noise and protection of recipients.

Module 4

Code	Course/Module Title	ECTS	Semester
ENV324	Soil Mechanics	6	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/3/0/0	93	57
Description			
This course aims to introduce the students to the category of Soil mechanics, which is the application of laws of mechanics and hydraulics to engineering problems dealing with sediments and other unconsolidated accumulations of solid particles produced by the mechanical and chemical disintegration of rocks, regardless of whether or not they contain an admixture of the organic constituent. This will be achieved through descriptive lectures.			

Module 5

Code	Course/Module Title	ECTS	Semester
ENV325	Engineering Project Planning and Design	2	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	33	17
Description			
Students will familiarize with the principles and phases of engineering project management. To empower students to select viable project themes and define engineering problems accurately. To equip students with the tools to navigate and utilize credible academic databases. To enhance students' proficiency in drafting comprehensive scientific and technical reports. To build students' confidence and competence in delivering professional oral presentations for project defense.			

Module 6

Code	Course/Module Title	ECTS	Semester
ENV326	Numerical Analysis	3	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/1	48	27
Description			
Students will be able to: understand fundamental concepts of numerical methods. , Develop computational problem-solving skills., Approximate solutions to mathematical problems., Analyze errors and convergence of methods., Apply numerical techniques using software (MATLAB/Excel)., Prepare students for advanced computational courses.			

Module 7

Code	Course/Module Title	ECTS	Semester
ENV327	Reinforced Concrete	4	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/1	48	52
Description			
This course is an introduction to the analysis and design of reinforced concrete structural members. Topics covered will include working stress and ultimate strength methods for beams subjected to flexural bending and shear stresses, detailing of flexural and shear reinforcement in beams and short columns subjected to axial load and bending.			

Fourth Level

1st Semester

Module 1

Code	Course/Module Title	ECTS	Semester
ENV411	Wastewater Treatment Plants Design	6	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/0/0/2	78	72
Description			
The course aims to enable students to understand the fundamental engineering principles and concepts related to wastewater treatment and its various stages, and to apply basic principles of mathematics and science in performing design calculations. It also focuses on analyzing wastewater treatment plant data and evaluating the efficiency and performance of its treatment units and their compliance with environmental specifications and requirements. The course further enhances students' ability to evaluate and design wastewater treatment units and plants using sound engineering practices. In addition, it encourages the adoption of innovative and sustainable solutions through the reuse of treated wastewater for irrigation and the utilization of biogas for energy generation.			

Module 2

Code	Course/Module Title	ECTS	Semester
ENV412	Structural Design	6	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
4	0/0/0/2	93	57
Description			
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.			

Module 3

Code	Course/Module Title	ECTS	Semester
ENV413	Environmental Project Management and Economy	4	7

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
4	0/0/0/0	63	37
Description			
This course provides a comprehensive introduction to project management, with a focus on engineering and construction projects. It covers the project lifecycle from initiation and planning to execution, monitoring, and control. Emphasis is placed on project planning techniques, work breakdown structures (WBS), scheduling methods such as Gantt charts and critical path networks (CPMs), program evaluation and review techniques, resource allocation, cost control, cash flow analysis, and work progress monitoring. The course also introduces the use of project management software to support effective planning, scheduling, and decision-making in engineering projects			

Module 4

Code	Course/Module Title	ECTS	Semester
ENV414	Environmental Impact Assessment and Regulations	3	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	33	42
Description			
This course introduces the principles and procedures of Environmental Impact Assessment (EIA) and the regulatory frameworks governing environmental protection. It covers impact identification and prediction, mitigation measures, environmental management and monitoring, preparation and review of EIA reports, and the application of relevant national and international environmental laws and regulations.			

Module 5

Code	Course/Module Title	ECTS	Semester
ENV415	Soil and Ground Water Pollution	4	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/0	63	37
Description			

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

Module 6

Code	Course/Module Title	ECTS	Semester
ENV416	Fundamentals of Hazardous Waste Management	4	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/0/0/1	63	37
Description			
This course provides an in-depth understanding of solid and hazardous waste characteristics and management. Some basics of radioactive waste characterization and handling are also provided. It is involving the study of the source, generation rates, and characteristics of hazardous wastes and their regulation, handling, treatment, and disposal. The course will emphasize on engineering process design, analysis and evaluation of different hazardous waste treatment technologies. Students will have the opportunity to study issues, processes, and problems involved in current hazardous waste treatment and management systems.			

Fourth Level

2nd Semester

Module 1

Code	Course/Module Title	ECTS	Semester
ENV421	Design of Water Treatment Plants	6	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0/0/0/2	63	87
Description			
The objectives of this module are to define raw water resources for water treatment plants, raw water quality. It also includes the principles and definition of drinking water treatment plant units and their types. After that the module describes how to design each unit and the design criteria. The objectives also include the practices of water supply operation and the quality of drinking water.			

Module 2

Code	Course/Module Title	ECTS	Semester
ENV422	Industrial and Petroleum Liquid Waste	6	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/0/0/1	63	87
Description			
This course provides an in-depth understanding of industrial and petroleum waste characteristics and management. Some basics of waste characterization and handling are also provided. It is involving the study of the source, generation rates, and characteristics of industrial and petroleum waste and their regulation, handling, treatment, and disposal. The course will emphasize on engineering process design, analysis and evaluation of different Industrial waste treatment technologies. Students will have the opportunity to study issues, processes, and problems involved in current industrial and petroleum waste and management systems.			

Module 3

Code	Course/Module Title	ECTS	Semester
ENV423	Air Pollution Control	6	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/0/0/0	48	102
Description			

The aim of this course will cover air pollution equipment's control. Initially students will learn how to apply the basic principles of sciences and engineering to solve issues associated with air pollution basics and control. Upon completion of this course students will be able to: Apply the treatment practices and devices due to the types of pollutants; Understand the design procedures for any type of air pollutant through assignments that demonstrate accomplishment of this outcome, and test problems and tutorials.

Module 4

Code	Course/Module Title	ECTS	Semester
ENV424	Civil Drawing	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
0	0/3/0/0	48	77
Description			
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 5

Code	Course/Module Title	ECTS	Semester
ENV425	Estimation and Specifications	4	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0/0/0/0	48	52
Description			
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, v o l u m e of concrete, masonry work, RC shuttering, RC steel quantity, construction finishing, sanitary and plumbing element are also covered. The coarse extended to use the Autocad & excel in estimation. The Bill of quantity, pricing and cost analysis, Introduction to project condition and specification are also included in this course. Practical exercises and case studies are included to enhance learning and application of concepts.			

3. Contact

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