University of Mosul

جامعة الموصل

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

بكالوريوس - هندسة البيئة

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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 (48) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظره عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة البيئة للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (48) مادة دراسية مع (6000) إجمالي ساعات حمل الطالب و 240 إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

First Level

Semester "1"

Module 1

Code	Course/Module Title	ECTS	Semester
ENV111	Mathematics	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			

There is a need to know how to deal with a large amount of data. The objectives of this module are 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 includes howto describe the data in a clear manner.

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 primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.			

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**
UOM101	Arabic	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0/0/0/0	33	17
Description			
تهدف الدراسة الى تعريف الطالب بالموضوعات الرئيسية بمادة اللغة العربية. سيغطي الفصل الدراسي المتطلبات الأساسية بتعاريف اللغة العربية، قواعد نحوية للأزمنة، تنمية القدرات النحوية بصيغة المفرد والجمع والممنوع من الجرد بالإضافة الى البلاغة والتطبيق			

Module 7

Code	**Course/Module Title**	**ECTS**	**Semester**
UOM104	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			
يهدف المقرر الى توسيع مدارك الطالب لمادة الديمقراطية وحقوق الإنسان، والإلمام بالحقوق الأساسية التي يجب ان يتمتع بها الفرد، والقدرة على التمييز بين الحقوق والواجبات، فضلا عن تعريف الطالب بمفهوم حقوق الانسان والتطور التاريخي لحقوق الانسان ومصادره الدينية والحقوق والحريات التي نص عليها الدستور العراقي.			

Semester "2"

Module 1

Code	Course/Module Title	ECTS	Semester
ENV121	Calculus	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			
To learn basic concepts and system of forces. To enable students to understand the relationship of physical processes, kinetics and kinematics. To develop skills 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			
الهدف من المقرر الدراسي هو تعريف الطالب بالمبادئ الرئيسية لهندسة البيئة وكل ما يخص التلوث البيئي : مقدمة عن البيئة والتلوث البيئي العوامل التي أدت إلى تدهور البيئة أنواع التلوث (تلوث الماء .تلوث الهواء. التلوث الضوضائي .تلوث حراري .التلوث الحراري، تلوث المياه مصادر المياه وخصائصها ,الخواص الكيميائية والفيزيائية للماء نوعية المياه ,تلوث المياه السطحية ومصادرها ,تلوث المياه الجوفية ومصادره، معاملة المياه لأغراض الشرب مع جدول بالوحدات وشرح مختصر لكل وحدة، معالجة وطرح مياه الفضلات، خصائص مياه الفضلات, هدف المعالجة, مخطط وحدات معالجة مياه الفضلات معالجة وطرح مياه الفضلات خصائص مياه الفضلات, هدف المعالجة, مخطط وحدات معالجة مياه الفضلات مع إجراء زيارات موقعيه للتعرف على وحدات المعالجة والمشاريع البيئة المقامة وقيد التنفيذ.			

Module 4

Code	Course/Module Title	ECTS	Semester
ENV124	Environmental Geology	3	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0/0/0/0	33	42
Description			
This course aims to introduce the students to the category of Environmental Geology Geology –is the . study of the earth, its materials and their properties, its internal and external physical, chemical, and .biological properties, and its historyEnviro nment – anything, living or nonliving that surrounds and influences living organisms. Environmental Geology – the application of geology to environmental concerns. This will be achieved through descriptive lectures.			

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			
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
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 1	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0/0/0/0	33	17
Description			
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. 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

Semester "3"

Three:-

Module 1

Code	Course/Module Title	ECTS	Semester
ENV211	Engineering Mathematics	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	0/0/0/2	78	47
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 (1_{st} order 1_{st} 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	0/2/0/1	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	Environmental Chemistry	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0/2/0/0	63	62

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)**
2	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, Ta**pe 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 aim of this course is to introduce the students to the area of hydrological processes and practices including introduction to Hydrology. 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
UOM2050	Crimes of Baath Party	2	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0/0/0/0	33	17
Description			
• توعية الطلاب بالجرائم التي ارتكبها البعث في العراق. • توجيه الطلاب للإلمام والمعرفة بالجرائم. • توعية الطلاب بخطورة الجرائم			

Module 8

Code	Course/Module Title	ECTS	Semester
UOM2022	English2	2	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**

2	0/0/0/0	33	17
Description			
The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.			

Semester "4"

Module 1

Code	Course/Module Title	ECTS	Semester
ENV221	Water Quality Engineering	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	0/2/0/0	78	72
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, Laws and Regulations, Mechanism of pollutant fate 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. Also, it incorporates the chemical concepts necessary for managing water quality and reducing pollution.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	5	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	0/2/0/0	93	32
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	5	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0/3/0/0	78	47
Description			
1- تقديم لمحة عامة عن المبادئ الفيزيائية للتحسس النائي. 2- تنمية مهارات محددة في استخدام برامج التحليل المكاني والتحسس النائي المستخدمة في البحث الجغرافي. 3-تعريف الطالب بمعالجة بيانات التحسس النائي وتطوير تطبيقات لإدارة موارد الأرض ومراقبتها 4-كيف يمكن تطبيق فهم كل هذه على مجموعة من التطبيقات البيئية. 5-كيفية انشاء قاعدة بيانات 6-الترقيم الالي للمرئيات الفضائية والتحليل المكاني 7-انشاء خارطة بيئية لمواقع التلوث وادخال البيانات الوصفية للمعالم الأرضية			

Module 4

Code	Course/Module Title	ECTS	Semester
ENV224	Microbiology	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0/2/0/0	63	37
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 2	2	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0/0/0/0	33	17

Description
تهدف الدراسة الى تعريف الطالب بالموضوعات الرئيسية بمادة اللغة العربية. سيغطي الفصل الدراسي المتطلبات الأساسية بتعاريف اللغة العربية، قواعد نحوية للأزمنة، تنمية القدرات النحوية بصيغة المفرد والجمع والممنوع من الجرد بالإضافة الى البلاغة والتطبيق

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.			

Contact

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