University of Mosul

First Cycle – Bachelor's degree (B.Sc.)

Climate Change Department

Table of Contents

1. Overview

This catalogue is about the courses (modules) given by the program of climate change to gain the Bachelor of Science degree. The program delivers (50) 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 العلوم البيئية/التغيرات المناخية للحصول على درجة بكالوريوس العلوم. يقدم البرنامج ما يقارب (50) مادة دراسية، على سبيل المثال، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2024-2025

Module 1

Code	Course/Module Title	ECTS	Semester
ENVC101	رياضيات	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	78	47
Description			
This course aims to provide an introduction to the basics of analysis, teaching the concepts of limits, derivatives, and integrals and their applications. It also aims to develop problem-solving skills and an understanding of differential and integral calculus theories through the application of integral techniques. The course also covers the definition of basic functions, calculating the limit of functions, studying their continuity, and calculating derivatives of functions. Using the derivative, students can graph and interpret the graph of functions, solve maximum and minimum value problems, classify integrals, use integration techniques, and define and classify improper integrals. In more detail, the course applies the concepts of derivatives and integrals. It also covers the definition of sequences, analyzing their convergence, identifying series and using convergence tests, and finding the Taylor and Maclaurin series expansions for given functions. Derivatives and their applications include the chain rule, the mean value theorem, and Rolle's theorem. Graphing			

curves includes concavity, concave-up, and concave-down problems, and sequences and series include convergence and divergence. Introduction to integration, definite integrals, and the fundamental theorem of calculus. Methods of integration - integration by parts, trigonometric integrals, integration of rational functions, improper integrals, and applications of integration. Sequences and series - convergence and divergence, tests of convergence of series - the integral test, the comparison test, the root and ratio test, alternating sequences, Taylor and Maclaurin series.

Module 2

Code	Course/Module Title	ECTS	Semester
ENVC102	**Introduction to climate changes**	4	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	37
Description			
It aims to provide students with a basic understanding of climate change by exploring its human and natural causes and its environmental, social, and economic impacts. The course covers concepts such as the global climate system, greenhouse gases, and the impact of human activities such as fossil fuel burning and deforestation. It also covers adaptation and mitigation strategies, such as the use of renewable energy, and international policies such as the Paris Agreement. The curriculum includes theoretical lectures, case studies, and interactive discussions, with an emphasis on developing environmental awareness and critical thinking skills. Students are assessed through quizzes, exams, and participation in practical activities, preparing them to contribute to sustainable solutions to climate challenges.			

Module 3

Code	Course/Module Title	ECTS	Semester
ENVC103	Biology	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			
Biology is the natural science that studies life and living organisms in all their forms, including their structures, functions, growth, development, and distribution. It focuses on understanding living organisms from the molecular and cellular levels to complex ecosystems, and includes the study of cells,			

biomolecules such as proteins and nucleic acids, and the biological processes that occur within living organisms.
Biology helps us understand how living organisms interact with each other and their environment, and is essential for developing medical and agricultural solutions, protecting biodiversity, and maintaining ecological balance. It also studies energy in living organisms and how it is converted to sustain life through processes such as photosynthesis and cellular respiration.
In short, biology aims to study life in all its details to understand the living world around us and apply this understanding in various fields such as medicine, agriculture, and the environment.

Module 4

Code	Course/Module Title	ECTS	Semester
ENVC104	Introduction to Environmental Science	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			
Ecology is a fundamental foundation for understanding the complex interactions that shape Earth's ecosystems and their role in sustaining life. This course aims to explore the biological processes and interrelationships that govern ecological balance, focusing on three main themes: The Water Cycle The water cycle is a vital process that regulates the availability of water resources and supports all forms of life. This unit examines how water evaporates, condenses, precipitates, and flows through ecosystems, and its role in maintaining natural habitats such as wetlands and forests. It also highlights the close interaction between the water cycle and other processes such as nutrient cycling (such as carbon and nitrogen) and climate regulation, demonstrating the integration of ecosystems in achieving planetary stability.			

Module 5

Code	Course/Module Title	ECTS	Semester
ENVC105	Geology	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			
Earth Science is an important subject for students in the Climate Change Department. Environmental science specialists need, at the very least, to have a good understanding of the types of minerals and			

rocks and their most important natural sources, as well as the processes of mineral formation, the rock cycle in nature, and climate change over geological time. Earth Science will provide students with an appropriate level of information and experience in the field of Earth Science, contributing to their scientific culture and academic preparation. It will help them master the basic principles of Earth Science, the processes of rock and mineral formation, and their classification methods. The course includes the theories of the formation of the Earth and its primary atmosphere, the processes of element formation and their universal abundance, the basic principles of crystallography, minerals, and rocks, their types and classification methods, as well as an overview of historical geology, mass extinctions, and the geological timescale.

Module 6

Code	Course/Module Title	ECTS	Semester
UOM102	English I	3	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	33	17
Description			
This section includes a description of the module, 100-150 words			

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/w)**
2	0	33	17
Description			
This section includes a description of the module, 100-150 words			

Module 8

Code	Course/Module Title	ECTS	Semester
ENVC106	General Physics	7	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	4	93	82
Description			
This section includes a description of the module, 100-150 words			

Module 9

Code	Course/Module Title	ECTS	Semester
ENVC107	General Chemistry	7	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	4	93	82
Description			
This section includes a description of the module, 100-150 words			

Module 10

Code	Course/Module Title	ECTS	Semester
ENVC108	Cartography	5	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	78	47
Description			
The Cartography course aims to teach students the basic concepts of map planning and analysis, with an emphasis on both theoretical and practical aspects. Students learn map elements, such as title, scale, and key, as well as different types of maps, including physical, human, and digital maps. The curriculum also includes the study of the coordinate grid and projection types, and the use of Geographic Information Systems (GIS) software to create maps and analyze spatial data. Learning is supported by theoretical lectures and practical laboratory sessions, where students apply their mapping and data transformation skills. The course is assessed through short quizzes, assignments, and final exams, ensuring students master the skills required in this interdisciplinary field.			

Module 11

Code	Course/Module Title	ECTS	Semester
ENVC109	Climate and biodiversity	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	5	78	72
Description			
This course aims to introduce students to the interactive relationship between climate and biodiversity on Earth's surface, and how climate change affects ecosystems and different species. The course covers basic concepts of climate science, such as the factors influencing global climate, natural and human-induced climate change, and an understanding of the components of biodiversity, including plants, animals, and microorganisms			

Module 12

Code	Course/Module Title	ECTS	Semester
UOM1031	Computer I	3	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	2	48	27
Description			
This course aims to introduce students to the interactive relationship between climate and biodiversity on Earth's surface, and how climate change affects ecosystems and different species. The course covers basic concepts of climate science, such as the factors influencing global climate, natural and human-induced climate change, and an understanding of the components of biodiversity, including plants, animals, and microorganisms.			

Module 13

Code	Course/Module Title	ECTS	Semester
UOM1011	Arabic language I	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	1	33	17
Description			
This section includes a description of the module, 100-150 words			

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