# University of Mosul

# جامعة الموصل

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

**بكالوريوس - هندسة البيئة**

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## 1. Mission & Vision Statement

***Vision Statement***

Leadership and excellence in environmental engineering in education, research, and application

***Mission Statement***

Consolidating the role of environmental engineering in community, raising the level of the graduate and developing his ability to compete in the labor market with high professionalism and employing it in achieving comprehensive and sustainable development.

## 2. Program Specification

| | | | |
|---|---|---|---|
| **Programme code:** | BSc-ENV | **ECTS** | 240 |
| **Duration:** | 4 levels, 8 Semesters | **Method of Attendance:** | Full Time |

In order to meet the program graduate outcomes, the department has developed a well-structured curriculum. The department adopts Bologna process system of study.

A part from acquiring discipline specific knowledge, the curriculum requires that graduates have sufficient knowledge of calculus, statistics, chemistry, Microbiology as well as an ability to apply this knowledge to the understanding of the core Environmental Engineering concepts, including analysis, design and realization of such concepts. The students are also required to be sufficiently familiar with computer applications for Environmental Engineering in addition to developing professional, life-long learning, and ethical skills required by professional environmental engineers. Laboratory instructions and design components play important role in Environmental Engineering education. Therefore, it is important to ensure that the undergraduate courses are accompanied with extensive design experience and carry out laboratory works in order to provide the students with sufficient practical experience in various fields of Environmental Engineering.

An important component of the curriculum is a 1-month mandatory summer training requirement. During this summer training, the students gain valuable practical training in real competitive environment which not only provide them with an insight to the modern environmental engineering practices followed today but also give them an opportunity to interact, collaborate and work together with the highly experienced professionals, which help students in their future professional growth.

Another important component of the curriculum is a design project course. During the design project course, the students gain valuable exposure to various types of activities involved in Environmental Engineering. In such a practical activity, most of student outcomes are addressed and assessed through 'project report and presentations' for each of the students, thoroughly examined by 3-4 internal (within faculty) examiners.

## 3. Program Objectives

- Our graduates will perceive engineering knowledge and skills that help them to advance their career in the field of environmental engineering
- Our graduates will establish themselves as practicing engineers in the field of environmental engineering, civil engineering and other related domains
- Our graduate will be provided by creative knowledge to fulfill the need of society

## 4. Student Learning Outcomes

The Environmental Engineering Department adopt the ABET Engineering Accreditation Commission "i"–to–"vii" general criteria graduate Outcomes (GOs), which comply with Iraqi Engineering Graduate's Attributes in terms of knowledge, skills, abilities ,attitudes, societal and environmental aspects (ethics):

I. An ability to distinguish, identify, define, formulate, and solve engineering problems by applying principles of engineering, science and mathematics.

II. An ability to produce engineering designs that meet desired needs within certain constraints by applying both analysis and synthesis in the design process.

III. An ability to create and carry out proper measurement and tests with quality assurance, analyze and interpret results, and utilize engineering judgment to make inferences.

IV. An ability to skillfully communicate orally with a gathering of people and in writing with various managerial levels.

V. An ability to perceive ethical and professional responsibilities in engineering cases and make brilliant judgments taking into account the consequences in worldwide financial, ecological and societal considerations.

VI. An ability to perceive the continual necessity for professional knowledge growth and how to find, assess, assemble and apply it properly.

VII. An ability to work adequately on teams and to set up objectives, plan activities, meet due dates, and manage risk and uncertainty

## 5. Academic Staff

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## 6. Credits, Grading and GPA

### *Credits*

Mosul University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

### *Grading*

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

| GRADING SCHEME<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **Group** | **Grade** | التقدير | **Marks (%)** | **Definition** |
| **Success Group (50 - 100)** | A - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | B - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | C - Good | جيد | 70 - 79 | Sound work with notable errors |
| | D - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | E - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | FX – Fail | راسب - قيد المعالجة | (45-49) | More work required but credit awarded |
| | F – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |
| Note: | | | | |
| Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. | | | | |

***Calculation of the Cumulative Grade Point Average (CGPA)***

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

   CGPA of a 4-year B.Sc. degree:

CGPA = [ (1st module score x ECTS) + (2nd module score x ECTS) + ……] / 240

## 7. Curriculum/Modules

**Semester 1 | 30 ECTS | 1 ECTS = 25 hrs**

| Code | Module | SSWL | USSWL | ECTS | Type | Pre-request |
|---|---|---|---|---|---|---|
| ENV111 | Calculus | 108 | 92 | 8.00 | S | |
| ENV112 | Engineering Drawing | 93 | 107 | 8.00 | S | |
| ENV113 | Environmental Thermodynamics | 48 | 52 | 4.00 | S | |
| ENV114 | Computer Programming | 63 | 87 | 6.00 | B | |
| ENV115 | Human Rights and Public Freedoms | 33 | 17 | 2.00 | B | |
| ENV116 | English 1 | 33 | 17 | 2.00 | B | |

**Semester 2 | 30 ECTS | 1 ECTS = 25 hrs**

| Code | Module | SSWL | USSWL | ECTS | Type | Pre-request |
|---|---|---|---|---|---|---|
| ENV121 | Engineering Mathematics | 108 | 67 | 7.00 | S | ENV111 |
| ENV122 | Engineering Mechanics | 108 | 67 | 7.00 | S | |
| ENV123 | Principles of Environmental Engineering | 63 | 37 | 4.00 | C | |
| ENV124 | Environmental Geology | 33 | 42 | 3.00 | B | |
| ENV125 | Statistics | 48 | 52 | 4.00 | S | |
| ENV126 | Drawing by Computer | 63 | 62 | 5.00 | S | |

**Semester 3 | 30 ECTS | 1 ECTS = 25 hrs**

| Code | Module | SSWL | USSWL | ECTS | Type | Pre-request |
|---|---|---|---|---|---|---|
| ENV211 | Fluids Mechanics | 108 | 92 | 8.00 | C | ENV122 |
| ENV212 | Environmental Chemistry | 78 | 47 | 5.00 | S | |
| ENV213 | Concrete and Building Technology | 93 | 57 | 6.00 | S | |
| ENV214 | Strength of Materials | 63 | 62 | 5.00 | S | ENV122 |
| ENV215 | Remote Sensing and GIS Applications | 63 | 37 | 4.00 | S | |
| ENV216 | English 2 | 33 | 17 | 2.00 | B | |

**Semester 4 | 30 ECTS | 1 ECTS = 25 hrs**

| Code | Module | SSWL | USSWL | ECTS | Type | Pre-request |
|---|---|---|---|---|---|---|
| ENV221 | Water Quality Engineering | 78 | 97 | 7.00 | C | ENV212 |
| ENV222 | Engineering Surveying | 93 | 57 | 6.00 | S | |
| ENV223 | Hydraulics Applications | 63 | 37 | 4.00 | C | ENV211 |
| ENV224 | Engineering Hydrology | 48 | 27 | 3.00 | S | |
| ENV225 | Engineering and Numerical Analysis | 63 | 62 | 5.00 | S | ENV121 |
| ENV226 | Microbiology | 63 | 62 | 5.00 | S | |

**Semester 5 | 30 ECTS | 1 ECTS = 25 hrs**

| Code | Module | SSWL | USSWL | ECTS | Type | Pre-request |
|---|---|---|---|---|---|---|
| ENV311 | Principles of Air pollution | 63 | 87 | 6.00 | C | |
| ENV312 | Water Networks | 63 | 112 | 7.00 | C | ENV223 |
| ENV313 | Solid Waste Management | 78 | 72 | 6.00 | C | |
| ENV314 | Noise and Thermal Pollution | 48 | 27 | 3.00 | C | |
| ENV315 | Soil Mechanics | 108 | 42 | 6.00 | C | ENV124, ENV122 |
| ENV316 | English 3 | 33 | 17 | 2.00 | B | |

**Semester 6 | 30 ECTS | 1 ECTS = 25 hrs**

| Code | Module | SSWL | USSWL | ECTS | Type | Pre-request |
|---|---|---|---|---|---|---|
| ENV321 | Air Pollution Control | 63 | 62 | 5.00 | C | ENV311 |
| ENV322 | Sewers Networks | 78 | 97 | 7.00 | C | ENV223 |
| ENV323 | Unit Operations & Processes | 78 | 72 | 6.00 | C | ENV212, ENV226 |
| ENV324 | Sustainability Engineering | 48 | 52 | 4.00 | C | |
| ENV325 | Hazardous Waste Management | 48 | 52 | 4.00 | C | |
| ENV326 | Reinforced Concrete | 48 | 52 | 4.00 | C | ENV214 |

**Semester 7 | 30 ECTS | 1 ECTS = 25 hrs**

| Code | Module | SSWL | USSWL | ECTS | Type | Pre-request |
|---|---|---|---|---|---|---|
| ENV411 | Design of Water Treatment Units | 63 | 87 | 6.00 | C | ENV323 |
| ENV412 | Wastewater Treatment Plant Design | 78 | 97 | 7.00 | C | ENV323 |
| ENV413 | Structural Design | 93 | 82 | 7.00 | C | ENV326 |
| ENV414 | Engineering Project management and Economy | 78 | 47 | 5.00 | C | |
| ENV415 | Engineering Project and Technical Writing | 48 | 27 | 3.00 | C | |
| ENV416 | English 4 | 33 | 17 | 2.00 | B | |

**Semester 8 | 30 ECTS | 1 ECTS = 25 hrs**

| Code | Module | SSWL | USSWL | ECTS | Type | Pre-request |
|---|---|---|---|---|---|---|
| ENV421 | Industrial and Petroleum Liquid Waste | 63 | 87 | 6.00 | C | ENV412 |
| ENV422 | Soil and Ground Water Pollution | 63 | 62 | 5.00 | C | |
| ENV423 | Estimation and Specifications | 48 | 52 | 4.00 | C | |
| ENV424 | Environmental Impact Assessment and Regulations | 33 | 67 | 4.00 | C | |
| ENV425 | Civil Drawing | 78 | 72 | 6.00 | C | ENV126, ENV413 |
| ENV426 | Engineering Project | 33 | 92 | 5.00 | C | ENV415 |

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