University of Oum El Bouaghi

Faculty of exact sciences and natural and life sciences

Department of natural and life sciences

Program name: Bachelor's degree in microbiology

- **Level: Bachelor**
- **Domain: natural and life sciences**
- **Field: biological sciences**
- **Specialty: Microbiology**

1. Program Description:

The Microbiology course offers students the opportunity to discover in greater depth the world of microorganisms that surround us and which play an essential role in all forms of life on earth and in our environment. A solid education in the fields of cell biology, genetics, ecology, molecular biology and biochemistry is first necessary to understand and study the roles of microorganisms.

This is why the first two years (L1 and L2) offer teaching that is largely common with the other biology courses. The students thus receive a basic training on the major concepts and the necessary experimental methods. A course in basic General Microbiology is also compulsory for all courses in the Biology option.

It is only at the level of the 3rd year (S5 and S6) that a more specific teaching is offered. The study of the structures and functions of microorganisms, the extraordinary genetic plasticity of microorganisms to adapt to their environment, their varied metabolism, their uses in biotechnology, their impact on animal and plant pathology and their interactions with the mechanisms of immune defences, are deepened.

The objectives of this training are:

- Knowledge of all the microorganisms that surround us;

- Mastery of laboratory techniques for handling microorganisms (isolation, culture, identification, etc.);

- Understanding and controlling the activities of harmful microorganisms;

- Understanding the impact of microorganisms on their environment and the influence of environmental factors on the behavior of microorganisms;

- The design of treatments and biotechnological processes taking into account economic, industrial and environmental imperatives;

- The influence of microorganisms and microbiological applications on daily life;

- The development of scientific projects (state of the art, description of the hypotheses adopted, structuring and organization, experimental approaches, technical and human resources) in various applied or fundamental fields.

2. Entry Requirements

- Master the systematics, metabolism and genomics of microorganisms.
- Understand the concepts and approaches of modern microbiology.
- Understand the role of microorganisms in their environment and their power to meet or control human needs.
- Raising awareness in the industrial world of ethics and safety related to the use of life technologies.

3. Program Units and modules

Semester 1

Fundamental units

- **UEF 1.1:**
  - **Subject 1:** General and organic chemistry
  - **Subject 2:** cellular biology

Methodological units

- **UEM 1.1:**
  - **Subject 1:** Mathematics Statistics Computer Science
  - **Subject 2:** Communication and Expression Techniques 1 (in French)

Discovery units

- **UED 1.1:**
  - **Subject 1:** Geology

Cross units

- **UET 1.1**
  - **Subject 1:** Universal History of Biological Sciences

Semester 2

Fundamental units

- **UEF 2.1**
  - **Subject 1:** Thermodynamics and chemistry of solutions
  - **Subject 2:** Plant's biology
  - **Subject 3:** Animal Biology

Methodological units

- **UEM 2.1**
  - **Subject 1:** Physical
  - **Subject 2:** Communication and Expression Techniques 2

Cross units

- **UET 2.1**
  - **Subject 1:** Work methods

Semester 3

Fundamental units

- **UEF 2.1.1**
  - **Subject 1:** Zoology
- **UEF 2.1.2**
  - **Subject 1:** Biochemistry
  - **Subject 2:** Genetic

Methodological units

- **UEM 2.1.1**
  - **Subject 1:** Communication and Expression Techniques
- **UEM 2.1.2**
  - **Subject 1:** Work methods

Discovery units

- **UED 2.1.1**
  - **Subject 1:** Biophysics

Semester 4

Fundamental units

- **UEF 2.2.1**
  - **Subject 1:** Botanics
- **UEF 2.2.2**
  - **Subject 1:** Microbiology
  - **Subject 2:** Immunology

Methodological units

- **UEM 2.2.1**
  - **Subject 1:** General ecology
- **UEM 2.2.2**
  - **Subject 1:** Biostatistics

Semester 5

Fundamental EU

- **UEF 3.2.1 (O/P): Microbial taxonomy**

Subject 1: Systematics of prokaryotes (Bacteria and Archaea)
Subject 2: Mycology-Algology-Virology

- **UEF 3.1.2 (O/P): Molecular microbiology**

Subject 1: Microbial biochemistry
Subject 2: Molecular biology and genetic engineering
Subject 3: Microbial genetics

EU discovery

- **UED 3.1.1 (O/P): Microbial biotechnology**

Subject 1: Microbial biotechnology

Transversal teaching units

- **UET 3.1.1 (O/P): Scientific English**

Subject 1: Scientific English

Semester 6

Fundamental EU

- **UEF 3.2.1 (O/P):** Applied Microbiology

Subject 1: Industrial Microbiology
Subject 2: Environmental Microbiology
Subject 3: Food microbiology

EU methodology

- **UEM 3.2.1 (O/P): Biostatistics**

Subject 1: Biostatistics

EU methodology

- **UEM 3.2.2 (O/P): Enzymology**

Subject 1: Enzymology
EU discovery

- **UED 3.2.1 (O/P): Microbiological control techniques**

Subject 1: Microbiological control techniques

4. Other

a. Regional and national employability potential

The student holding a license degree in Microbiology can
- enter working life by entering various competitions where the required level is bac + 3.
- acquire a second skill by following another training course or by applying for recruitment by competitive examination or on file in the national engineering school (ENSB).
- continue your Master's studies (2 years M1 and M2: access by application and/or interview) at the Larbi Ben M'hidi University of Oum El Bouaghi or at another Algerian university. At the University of Oum El Bouaghi, students from the Microbiology license have the opportunity to pursue a master's degree in "Applied Microbiology". The "Applied Microbiology" master's was built as a logical continuation of the "Microbiology" course.

The professions to which a student with a license in Microbiology can access:
- Jobs in basic and applied research in Microbiology (Bac+3 level: senior technician) in public and private research organizations, in the food-processing industries, pharmaceutical industries, biotechnologies, etc.
- Sales professions: medical representatives, technical sales representatives, maintenance of scientific equipment, etc.
-Consulting professions: consultants, experts with legal firms or institutions, ...
- Primary education professions.
- Science journalism professions.

b. Gateways to other specialties

The academic license in microbiology offers the possibility of preparing a master's degree or a doctorate in the various fields of fundamental or applied microbiology.

c. Performance indicators expected from the training

(Viability criteria, success rate, employability, monitoring of graduates, skills achieved, etc.)
The monitoring of the project is based on the essential characteristic of the LMD system which promotes the continuous control of knowledge which must be ensured by the coordination of the teaching team whose mission will be to:
- Define monitoring indicators
- Ensure the follow-up of the project
- Manage the process
- Acquire a real project management methodology
- Master each step and the project management tools