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| **Identity card of the specialty: Applied Microbiology** |

**Level:**Professionalizing academic master's degree

**Domain:**natural and life sciences

**Sector:**Biological sciences

**Speciality:**Applied Microbiology

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| **1- Location of the training:** |

**Faculty (or Institute)**: Natural and life sciences (SNV)

**Department**: Biology

References of the enabling order: Order No. 1311 of August 9, 2011

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| **2- External partners:** |

**Companies and other socio-economic partners**:

Bechar Hospital, SUDLAIT-Igli. Bechar, ERIAD. Becha, AGRODIV. Bechar

**International partners**:To be added (see the agreements established with foreign universities)

**Other partner establishments**: Quality control and assurance laboratory. Béchar, Department of Chemistry-University of Bechar

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| **3- General organization of the training: position of the project** |

Students wishing to access the "Applied Microbiology" master's degree will have to master the fundamental and general knowledge in biology, acquired in common base and under license. Applicant students must acquire basics in general microbiology (systematics of prokaryotic and eukaryotic microorganisms), in food, industrial and environmental microbiology, in microbial biochemistry, genetics, molecular biology and genetic engineering. General notions of physiology/physiopathology and immunology are desirable.

The license specialties that can give access to this Master are, in particular:

* License in LMD microbiology;
* License in LMD Biochemistry;
* License in LMD Molecular Biology.
* Veterinarian

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| **4- Context of the training:** |

The rapid and unprecedented development of agri-food and drinking water and wastewater treatment technologies, the progress made in the field of health and the environment require robust and long-lasting scientific and technological skills. In this direction,the objectives of this master are multiple and will be articulated around a disciplinary deepening in microbiology and its application in various fields, in particular agri-food(microbial alterations of food, risks of toxi-infections, etc.), water(purification and purification treatments), clinic(infectious diseases, antibiotic resistance of pathogens, etc.), biotechnology and environmental. Indeed, microbiology is at the heart of the challenges of scientific research.The renovation of higher education is a necessity to face the new challenges.

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| **5- Objectives of the training:** |

The major interest of this training in applied microbiology is to demystify the microbiological risk which is omnipresent in our food, water and our daily environment (food industry, hospital, etc.). Particular attention is paid to the risk of infection, through better knowledge of pathogenic agents (bacteria, parasitic fungi or viruses), diagnostic techniques, the study of the behavior of microorganisms with regard to antimicrobial agents and to antibiotic resistance. Microbial pathogenesis is also extended to plant diseases, while highlighting the positive and/or negative interactions of soil microbial flora with plants through the study of certain models, which will allow us to improve control techniques. biological. The section of biotechnology of microorganisms emphasizing the subjects of process engineering and microbial fermentations, the production of metabolite as well as water treatment and bioremediation will also be studied. The methodological approach of this master includes, on the one hand, molecular and genetic engineering tools applied in particular to the research and identification of microorganisms in different matrices; on the other hand, the statistical tool applied to the analysis of biological data will also be discussed. Finally this master molecular and genetic engineering tools applied in particular to research and identification of micro-organisms in different matrices; on the other hand, the statistical tool applied to the analysis of biological data will also be discussed. Finally this master molecular and genetic engineering tools applied in particular to research and identification of micro-organisms in different matrices; on the other hand, the statistical tool applied to the analysis of biological data will also be discussed. Finally this masteraims to provide training for students in the current challenges of microbiology, professionalization and training for research as well as a balanced multidisciplinarity.

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| **6- Profiles and skills targeted:** |

The "Applied Microbiology" master's degree is an academic training of a professional nature which opens up to executive positions in research and development or in fundamental research, but also to professional activities emanating from several fields in relation to the training of master's students; this in public and/or private structures. The lessons aim to ensure a solid general culture guaranteeing the ability to evolve and assimilate new technologies, but also to acquire know-how allowing the trained executive to be operational in various fields, in the occurrence, the agri-food sector, biomedical and the environment.

Conceptually and theoretically, the skills to be acquired lie in the organization of fundamental and specialized knowledge having a relationship with the field of nature and life and that of microbiology more particularly. This training therefore allows the acquisition of knowledge on systematics, microbial biochemistry, physiology and genomics of micro-organisms (bacteria, fungi, algae and protozoa); which allows, on a practical level, the development of skills in conventional and molecular techniques for the identification, biocontrol and manipulation of microorganisms. Also, we aim to develop synthesis skills in students and to self-train and self-inform and this, by a fairly large volume of hours in the form of personal work.

The lessons provided will allow the master student:

* understanding the behavior of microorganisms in different matrices (water, soil, sediment, food, living tissues) through better knowledge of their metabolic activities and their functionalities, and the analysis of host-microorganism interactions in a given ecosystem ( symbiosis-parasite-pathogens);
* knowledge of the mechanisms of adaptation and functioning of micro-organisms in their environment (adaptations, biodegradation, depollution, resistance, etc.) and the study of the different mechanisms of pathogenicity and resistance to infection;
* understanding of the notions of hygiene, control of locally manufactured or imported products, standards and microbiological controls of the industrial and hospital environment; And
* specific mastery of the strategies, approaches and methods to be implemented to enable the prevention of health risks and the biocontrol of pathogenic microorganisms.

The student thus trained will be able to pursue doctoral studies in one of the disciplines of microbiology and integrate research teams in specialized laboratories. He may also be employed as a senior executive in sectors as varied as those in the food, health and environment industries.

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| **7- Local, regional and national employability potential:** |

The industrial platform of the wilaya of Béchar has in its environment agri-food industries (dairies, canneries, fruit-based juice and drink production companies, oil mills, etc.), hygiene laboratories specializing in water quality control and food, medical analysis laboratories, a veterinary center, in addition to a few drinking water treatment stations intended for human consumption and wastewater treatment stations. These types of organizations are also located in across the whole country.