BSc IN BIOTECHNOLOGY

Duration: 4 years full time. 60 ECTS per year.

Language: Spanish.

Program aims:

The Biotechnology Degree at UNIZAR aims to provide with interdisciplinary training integrating conceptual, manual skills and technical knowledge of the functions and potential of living beings to understand and manage biomolecules at the molecular and cellular levels. Training in this degree is complemented with knowledge of the areas of bioinformatics, bioethics, legislation, and management. On these conceptual and technical basis, future professionals will be able to apply science and technology to biomolecules, living beings and their cellular or molecular behavior to improve and develop goods or services in diverse areas of human activities: Chemistry, Agriculture, Health, Bioremediation, etc,… Training will also allow them to check biosecurity, the registry and the administrative authorization of biotechnological products. The degree will particularly provide a good knowledge of the structure and characteristics of biomolecules and the principles and procedures used in their production and characterization. It will also provide an integrated view of the cell and its performance in its biological context, as well as knowledge of the molecular foundations of gene information and management skills for their manipulation on microorganisms, plants and animals. Biotechnology is a field in major expansion that has diversified towards a wide variety of areas, such as medicine and health, agro-food production, industrial production, energy and the environment. All of these areas will be covered during training.

The integrated set of this knowledge will allow those who pursue the degree to:

- Recognize and evaluate ecologic, environmental and health problems in the development and application of molecular life sciences.
- Use Biotechnology to characterize and conserve genetic biodiversity, improve production processes, protect the environment and improve the quality of life.
- Apply the legal and ethical bases involved in the development and application of molecular life sciences.
- Develop biological tools with technological impact in diverse human activities: industrial production, agriculture, health, bioremediation, energy, etc…

Structure:

3˚Æˇ#1#–#1#

#

Year 1. In the first year students must register in the following modules:

Module	ECTS	Semester
27100 - General Chemistry[ELF]	12	YL
27101 - Mathematics[ELF]	9	YL
27102 - Physics[ELF]	9	YL
27103 - General Biology[ELF]	12	YL
27106 - Statistics[ELF]	6	S1
27105 - Genetics[ELF]	6	S2
27111 - Organic Chemistry[ELF]	6	S2

S1: Semester 1. Mid-September to mid-January

S2: Semester 2. Beginning-February to end-May

YL: Year-long. Mid-September to end-May

[ELF]: English-language friendly module (see first page)

Year 2. In the second year students must register in the following modules:

Module	ECTS	Semester
27107 - Instrumental Techniques in Biotechnology[ELF]	9	YL
27108 - Biochemistry	12	YL
27109 - Microbiology[ELF]	9	YL
27110 - Physical Chemistry[ELF]	6	S1
27113 - Macromolecules Structure[ELF]	6	S1
27104 - Physiology[ELF]#	6	S2
27112 - Immunology[ELF]	6	S2
27114 - Plant Physiology[ELF]	6	S2

#

Year 3. In the third year students must enroll in the following modules:

Module	**ECTS**	**Semester**
27115 - Chemical Engineering[ELF]	9	YL
27116 - Clinical Biotechnology[ELF]	9	YL
27117 - Molecular Biology[ELF]	6	S1
27118 - Cell Culture[ELF]	6	YL
27119 - Introduction to Management Systems	6	S1
27126 - Environmental Biotechnology[ELF]	6	S1
27120 - Social and Legal Elements[ELF]	6	S2
27121 - Genetic Engineering[ELF]	6	S2
27123 - Bioinformatics[ELF]	6	S2

Year 4. In the fourth year students must enroll in the following modules:

Module	**ECTS**	**Semester**
27124 - Bioreactors[ELF]	6	S1
27125 - Plant Biotechnology[ELF]	6	S1
27128 - Microbial Biotechnology[ELF]	6	S1
27127 - Animal Biotechnology[ELF]	6	S2
27129 – Undergraduate Dissertation ELF*	10	YL

In this fourth year they must also select three modules from the list of optional modules:

Module	ECTS	Semester
27132 - Biochemistry of Nutrition[ELF]	6	S2
27137 - Pharmacology[ELF]	6	S1
27131 - Biophysics[ELF]	6	S1
27133 - Wine Biochemistry and Microbiology	6	S1
27134 - Food Biotechnology[ELF]	6	S2
27135 - Biotechnology applied to Immunology and Microbiology[ELF]	6	S2
27148 - Molecular Basis of Cell Communication and Cancer[ELF]	6	S2
27150 – Introduction to Systems Biology	6	S2
27147 – Internship	6	YL

*__Undergraduate Dissertation__

Undergraduate Dissertation (UD) is a 250 hours project on any of the subjects of the Degree. It is undertaken during the 4th year. Students are supervised by a professor who defines the objectives of the project and guides them along the work. Students must write a report and give a public presentation of it.