

## **BIOTECHNOLOGY** – studies in English

First-cycle (**Bachelor's degree**)

**DURATION: 7 Semesters**

**LANGUAGES: English**

**PACE: full time**

**APPLICATION DEADLINE: July 31**

**INTAKE (classes start in): October**

**TUITION FEES: 1,200 EUR / per semester \***

**STUDY FORMAT: on-campus**

\* plus additional non-refundable 85 PLN or 100 PLN (approx. 21 EUR or 24 EUR) recruitment fee

### **INTRODUCTION:**

Our Bachelor's program in Biotechnology offers a unique opportunity for science enthusiasts to delve into biology and technology. Gain a solid foundation in biotechnology, with theoretical knowledge and practical skills essential for this dynamic field. You will learn about molecular biology, cell biology, genetics, and microbiology, understanding the molecular structures and functions of organisms, and acquiring laboratory techniques used in biotechnology.

### **ADMISSIONS:**

- A high school diploma or equivalent with strong academic performance, particularly in subjects such as biology, chemistry, physics, and mathematics
- A strong interest in biological sciences and technology, with a curiosity about how biotechnology can solve real-world problems
- A keen eye for detail to ensure precision and accuracy in laboratory work, data collection, and analysis

### **PROGRAM OUTCOME:**

- Employment perspectives in the biotechnology industry and related industries
- As specialists in companies using modern engineering techniques for the selection and modification of microorganisms and higher organism cells, and the production of bioproducts
- In centers developing and popularizing modern techniques and technologies, including in agriculture, horticulture, forestry
- In institutions dealing with practical aspects of environmental protection, recycling, and biotechnological processes in environmental engineering
- In research laboratories

## Curriculum

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### Year I

#### Semester 1

- Mathematics
- Elements of physics
- General chemistry
- Computer utility programs
- Academic communication
- Engineering graphics
- Environmental protection
- OSH and ergonomics
- Economics in environmental biotechnology
- Safety in biotechnology
- Protection of intellectual property
- Training on safe and hygienic learning conditions

#### Semester 2

- Foreign language I (English, German)
- Qualitative chemical analysis
- Quantitative chemical analysis
- Fundamentals of soil science
- Molecular biology
- Environmental biology
- Biodiversity conservation
- Spread of pollutants in the environment
- Environmental chemistry
- Ecology
- Ecological aspects of biotechnology

### Year II

#### Semester 3

- Foreign language II (English, German)
- Physical education I
- Biochemistry I
- Organic chemistry
- General genetics
- Fundamentals of environmental microbiology
- Microorganisms in industrial processes
- Microorganisms in environmental technologies
- Circular economy
- Green technologies
- Fundamentals of toxicology
- Ecotoxicology

#### Semester 4

- Foreign language III (English, German)
- Physical education II
- Biochemistry II
- Bioprocess engineering
- Unit operations in biotechnology
- Molecular techniques in environmental analysis
- Environmental management
- Environmental monitoring
- Biomaterials
- Nanomaterials

#### Year III

##### Semester 5

- Foreign language IV (English, German)
- Bioreactor engineering
- Genetic engineering in environmental biotechnology
- Wastewater biotechnology
- Enzymology
- Enzyme technology
- Bioremediation of soil and water environment

##### Semester 6

- Tissue and cell cultures
- Fundamentals of mycology
- Biohydrometallurgical processes
- Biotechnology in forestry
- Biotechnology in agriculture
- Waste biotechnology
- Biotechnological production of energy carriers
- Biotechnology in food production
- Pharmaceutical and cosmeceutical bioproducts
- Biological water treatment
- Biological gas treatment

#### Year IV

##### Semester 7

- Experimental work methodology
- Visualization and data analysis techniques in environmental biotechnology
- Biostatistics
- Fundamentals of environmental biotechnology design
- Fundamentals of industrial biotechnology design
- Diploma seminar
- Engineering thesis