



## **BYDGOSZCZ UNIVERSITY OF SCIENCE AND TECHNOLOGY**

Faculty of Agriculture and Biotechnology

### **Biotechnology second-cycle studies**

Master's degree education in the field of BIOTECHNOLOGY will provide you with broadly understood knowledge in the field of designing biotechnological processes and their conduct to obtain products with desired characteristics for agriculture, food industry, pharmaceuticals, horticulture, environmental protection, and others. You will gain not only knowledge but also the necessary skills, which you can improve during internships and visits to companies in the biotechnology industry, such as VITROFLORA, one of the largest companies in this industry in Poland and Europe. You can also expand your knowledge and skills, depending on your interests and aspirations as part of specialty subjects and subjects to choose from, as well as develop your passions and carry out research projects in thriving scientific circles: BioX, ExPlant. Our students can boast numerous prestigious achievements and awards for their research, which proves the high level of education in the field of Biotechnology. Here you will acquire the latest academic knowledge and practical skills that will prepare you to solve real problems related to biotechnological processes and the management of institutions applying industrial biotechnological processes. In addition, the Biotechnology course enables contact with foreign lecturers and trips to European universities under European programs, such as POWER or Erasmus +. Learning about research methods in biotechnology, used in the biotechnology, pharmaceutical, cosmetic, food industries, and agricultural or horticultural enterprises, as well as developing the habit of using literature and a solid basis of directional knowledge will allow you to undertake research, teaching, or instructor work in the future. Biotechnology studies at the Faculty of Agriculture and Biotechnology also give you the opportunity to meet students from different parts of the world thanks to scientific and didactic cooperation with many foreign universities.

### **Specialties**

#### **molecular diagnostics**

The aim of education in the new specialization "Molecular Diagnostics" in the Biotechnology II degree course is to provide broadly understood knowledge, skills, and social competencies in the field of biotechnological processes analysis and molecular diagnostics. Graduates of Biotechnology with the specialization in "Molecular Diagnostics" will be able to work in diagnostic laboratories, research facilities, research laboratories, as well as in the biotechnology, food, and pharmaceutical industries, both in Poland and abroad, or continue their education at the Doctoral School. See the study plan for more information.

### **Where, and what kind of job is waiting for you?**

After completing your Master's degree in Biotechnology, you will be prepared to work in the broadly understood biotechnology and related industries. You will be able to work in units of the biotechnology industry research facilities, research laboratories with the use of biological material and conducting biotechnological processes used in horticulture, food and pharmaceutical industries and environmental protection, etc. Many graduates of Biotechnology successfully work in renowned laboratories around the world. If you are interested in developing your scientific passion, we invite you to 2nd and 3rd-degree studies to work at universities or research and scientific institutions in the future.

### About the study program

The Master's degree program in the field of BIOTECHNOLOGY significantly extends the knowledge acquired at the stage of engineering studies. As part of the second-cycle studies, in addition to a few basic subjects, you will learn, among others, Molecular methods in microbial biotechnology; Modern methods for genome study. During your studies, you can pursue interesting internships in Poland and abroad, including within the Erasmus + program <http://iro.utp.edu.pl/index.php/pl/erasmus> You can also do internships abroad, e.g. in : the USA - The Ohio Program Australia OzTerra Australian Adventures Check out the full program and see how much more you can learn! **SPECIALIST KNOWLEDGE** Biotechnology studies provide the opportunity to learn about various aspects of biotechnology (plant, animal, and microorganism biotechnology), which broadens the possibilities of finding a job in various areas of the biotechnology industry. The implementation of Biotechnology classes takes place in small laboratory groups, which gives students the opportunity to directly learn how to use modern and unique in the country scientific equipment (e.g. flow cytometers, confocal microscope, thermocyclers, RT-PCR, HPLC, etc.)

### Course content

<b>BIOTECHNOLOGY: second-cycle studies Speciality: molecular diagnostics</b>	Exam	Pass	ECTS	Lecture	Class	Laborat ory	Semina r
<b>First semester</b>							
Methodology of experimental work	1	1	5	30		20	
Bioinformatics	1	1	4	20		20	
Foreign language		1	2			30	
Stress physiology and ecological aspects of biotechnology	1	1	6	30		40	
Genetic engineering	1	1	6	20		50	
MSc Thesis Seminar		1	2				20
Basic diagnostic methods and techniques		1	2	10		20	
Elective Course: 1. Microorganisms as biological weapons 2. Mushrooms and human health		1	1	15			

3. Releasing plants from viruses							
Diploma internship		1	2				
<b>Second semester</b>							
Molecular methods in microbial biotechnology	1	1	8	30		60	
Social and economic aspects of biotechnology		1	5	30	15	15	
MSc Thesis Seminar		1	2				20
Molecular diagnostics in plant breeding	1	1	4	20		40	
Plant genomics and proteomics	1	1	3	15		30	
Transgenic plants		1	2	15		30	
Graduation laboratory		1	2			45	
Genetic diagnostics in animal husbandry	1	1	3	24		30	
Elective Course: 1. Biotechnology of legumes 2. Vegetable plants - properties and application 3. Diagnostics of oxidative stress in plant cells 4. The use of genetic markers in animal husbandry		1	1	15			
<b>Third semester</b>							
Bioreactors		1	3	24		24	
MSc Thesis Seminar		1	2				24
Diagnostics of food hazards		1	3	24		24	
Elective Course: 1. Chromatographic techniques 2. Morphogenesis in in vitro cultures 3. Technologies of micro-propagation of crops		1	2	24			
Preparation of a MSc Thesis and Exam Revision	1		20				