

# FACULTY OF BIOLOGY AND BIOTECHNOLOGY

## University of Warmia and Mazury in Olsztyn, Poland



*Field of study:* **Biology**  
*Specialty training:* **Medical Biology**  
*Level:* **The first degree program**

*Number of ECTS credits:* **180**  
*Educational profile:* **General academic**  
*Type of study:* **Full-time**  
*Professional degree obtained by graduate:*  
**Bachelor of Science (Licentiate)**



### EXPECTED LEARNING OUTCOMES AND QUALIFICATIONS

#### IN CATEGORY "KNOWLEDGE" THE GRADUATE:

1. understands and is able to use mathematical tools to describe natural phenomena;
2. has a basic knowledge of statistical methods used in biology;
3. understands physical processes, natural phenomena and their relationship with the functioning of living organisms;
4. understands the relationships between geological, geochemical and climatic diversity and the structure of biomes;
5. has knowledge of the diversity and biology of life forms;
6. has knowledge of the structure and functional diversity of living organisms at different levels of organization;
7. understands, defines and characterizes biochemical and physiological processes of prokaryotic and eukaryotic organisms at the molecular and cell level;
8. understands the relationships between and the regulation of physiological processes;
9. is familiar with the principles of inheritance, coding and the flow of genetic information;
10. has a fundamental knowledge of genetic engineering, molecular diagnostics, gene therapy, molecular basis of inherited diseases and cancer;
11. has knowledge of the molecular and cellular bases of immune responses;
12. understands the role and goals of taxonomy and the principles of contemporary biological nomenclature;
13. understands the processes, mechanisms and theories of biological evolution;

14. characterizes the structure and functions of ecological systems at different levels of organization;
15. characterizes biodiversity at the genetic, species and ecosystem level;
16. can describe the causes and consequences of environmental degradation, is familiar with contemporary problems in nature conservation and environmental protection, including environmental protection laws and biodiversity protection measures;
17. has knowledge of biotechnological applications of living organisms in medicine, agriculture, industry, nature conservation and environmental protection;
18. is familiar with basic equipment and devices used in laboratory analyses and field research;
19. understands the specificity of experiments in life sciences;
20. has a fundamental knowledge of experimental and field research methods;
21. is familiar with IT tools used for processing and interpreting research results;
22. has a fundamental knowledge of biochemical, genetic, microbiological, histological and immunological techniques;
23. has a fundamental knowledge of experimental techniques and tools used in biological laboratories;
24. has a fundamental knowledge of ergonomics, occupational health and safety principles for handling biological materials;
25. is familiar with copyright laws, industrial property and copyright laws applicable to biology and biotechnology;
26. is familiar with the general principles of entrepreneurship in biology and biotechnology;
27. has a fundamental knowledge of English vocabulary in biological sciences;
28. is familiar with the requirements for delivering scientific presentations in Polish and English.

## **IN CATEGORY "SKILLS" THE GRADUATE:**

1. is able to describe biological phenomena with the use of simple mathematical methods and mathematical descriptions;
2. can analyse data with the use of basic statistical methods;
3. can perform simple observations and simple physical, biological and chemical measurements;
4. is familiar with basic biochemical, genetic, microbiological, histological and immunological techniques in biology;
5. can deploy standard methods in molecular biology;
6. can perform quantitative and qualitative analyses to the extent required for explaining biological phenomena and processes;
7. is familiar with simple techniques for processing biological material.
8. can use simple research equipment;
9. is able to perform simple research tasks and expert analyses under the supervision of a tutor;
10. understands Polish and English literature relevant to biological sciences;
11. is able to select and critically analyze research data in Polish and English
12. and to use the available sources of scientific information;
13. can collect and process research data, and communicate scientific information;
14. observes copyrights and intellectual property rights when publishing articles and using computer graphics, is able to use patent information;
15. is able to deliver presentations in Polish addressing problems in the field of biological sciences;
16. is able to pursue a directed individual study plan, transfer and disseminate knowledge, and develop skills;
17. demonstrates language competency in scientific disciplines relevant for the field of study at B2 level according to the Common European Framework of Reference for Languages;
18. is able to use professional language in the field of biological sciences

## IN CATEGORY "SOCIAL SKILLS" THE GRADUATE:

1. is able to use professional language in discussions with specialists from related scientific areas;
2. is able to plan a scientific career, recognizes the need for lifelong learning and skills improvement;
3. is capable of performing different roles and choosing priorities in a team effort;
4. recognizes the need for competence building and personal development;
5. recognizes the need for updating knowledge of biology;
6. is aware of responsibility in assessing the risks arising from the use of biological tools and hazardous materials in the workplace, recognizes the significance of health and safety regulations;
7. has a knowledge of the possible applications of biological material, recognizes the need for ethical behaviour in handling biological material;
8. can think and act as an entrepreneur or a member of an organized volunteer effort

## QUALIFICATIONS

The graduate has the skills and knowledge required for handling biological materials in research and analytical laboratories. He/she has the theoretical and practical knowledge necessary for designing and performing basic biological procedures. He/she has fundamental knowledge in basic fields of biology, understands basic natural phenomena and correlations between environmental components. He/she can plan and perform field studies aiming to identify plants and animals as well as basic tasks related to environmental protection and nature conservation. He/she has a pro-active attitude towards learning and solving scientific and practical problems in biology. He/she has fundamental knowledge of biology. He/she observes health and safety regulations in laboratories. He/she has teamwork and organizational skills. He/she can collaborate with experts from all relevant fields. He/she is creative and has developed self-study skills. He/she is able to share the acquired knowledge with the public. He/she is ready to start a career or pursue a Master's degree.

**The Medical Biology graduate** has knowledge of human physiology and understands the relationships between and the regulation of human physiological processes. He/she is able to define and describe biochemical and physiological processes in the human body at the molecular, cellular, tissue and organ level. He/she has knowledge of basic methods of molecular detection, genetic engineering, diagnostic parasitology, mycology, toxicology and microbiology. He/she is familiar with basic methods of health status assessment. He/she is familiar with basic psychological and social concepts and mechanisms related to health and health protection. He/she is familiar with the basic principles of health and healthy lifestyle promotion. He/she is familiar with legal, organizational and ethical principles in biological research. He/she is familiar with basic equipment and instruments used in biomedical laboratories. He/she understands basic work principles in medical laboratories. He/she is able to operate basic equipment and instruments applied in biomedical research. He/she maintains the required level of physical fitness for performing professional tasks relevant to the field of study. He/she shows respect for patients, clients and social groups, and demonstrates concern for their welfare. He/she uses correct nomenclature in the field of medical biology. He/she is familiar with the general principles of entrepreneurship in the field of natural sciences and medical biology. He/she is able to handle and work safely with biological materials. He/she can cooperate with certified experts in medical analysis and diagnosis and can participate in research involving biological materials.