



Lodz University
of Technology

Study programme

Faculty:	Faculty of Biotechnology and Food Sciences
Major:	Biotechnology
Level of study:	second-cycle programme (magister)
Form of study:	full-time studies
Academic year:	2026/27

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Basic information

Name of the field of study:	Biotechnology
Level of study:	second-cycle programme (magister)
Study profile:	general academic
Form of studies:	full-time studies
Duration of studies (number of semesters):	3
The number of ECTS points required to complete studies:	90
Total number of hours of classes:	1170
The number of ECTS points a student obtains as part of classes conducted with the direct participation of academic teachers or other persons conducting classes:	47
Professional title awarded to graduates:	magister
ISCED code:	
Language of study:	polish

Assigning the course to the disciplines to which the learning outcomes relate

Discipline	Percentage share
Food technology and nutrition	55%
Chemical engineering	30%
Chemical science	15%

Learning outcomes (in relation to the PQF)

No.	Learning outcome code	Learning Outcome Content	Reference to the universal characteristics of the first level of PRK	Reference to the second-level characteristics of the PRK, taking into account the second-level characteristics enabling the acquisition of engineering competences
1	2BIO1	Demonstrates an advanced understanding of selected biological, chemical, and molecular facts, phenomena, and processes within the natural, agricultural, and engineering sciences as applied in industrial, environmental, and food biotechnology, including the mechanisms underlying the functioning and modification of biological systems, the principles of designing and analyzing biotechnological processes, and the ability to identify and critically analyze the main directions of development in these fields.	P7U_W	P7S_WG
2	2BIO10	Is prepared to consciously assume responsible professional roles in the field of biotechnology, adapting to changing social and environmental needs; to develop their professional and scientific achievements, including through further education and research; and to uphold the professional ethos as well as adhere to and advance the principles of professional ethics.	P7U_K	P7S_KR
3	2BIO2	Has advanced knowledge of the dilemmas of contemporary civilization related to the development and applications of biotechnology, particularly in food production, therapeutics, and plant and environmental protection, as well as of the economic, legal, and ethical determinants of professional practice in the field of biotechnology, including regulations governing business activity, and understands the principles of establishing and developing entrepreneurship in the biotechnology sector.	P7U_W	P7S_WK
4	2BIO3	Demonstrates the ability to adapt and implement innovative solutions in the fields of industrial biotechnology, environmental biotechnology, and food biotechnology, independently solving complex problems through the application of modern research methods and advanced computational and bioinformatics tools.	P7U_U	P7S_UW
5	2BIO4	Is able to independently design, optimize, and conduct advanced biotechnological experiments, as well as develop processes, systems, and innovative technological solutions applied in research and biotechnological practice, adapting them to the specificity and complexity of research problems in industrial, environmental, and food biotechnology.	P7U_U	P7S_UW
6	2BIO5	Is able to communicate clearly and professionally in academic and professional environments and to engage in debate using precise and specialized terminology appropriate to industrial, environmental, and food biotechnology, including the use of a foreign language in the field of specialized biotechnological terminology at a level of at least B2+ according to the Common European Framework of Reference for Languages (CEFR).	P7U_U	P7S_UK
7	2BIO6	Is able to lead a team carrying out research or technological tasks in the fields of industrial, environmental, and food biotechnology, assume a leading role in teamwork, and collaborate effectively with individuals possessing diverse scientific and technical competencies.	P7U_U	P7S_UO

No.	Learning outcome code	Learning Outcome Content	Reference to the universal characteristics of the first level of PRK	Reference to the second-level characteristics of the PRK, taking into account the second-level characteristics enabling the acquisition of engineering competences
8	2BIO7	Is able to independently plan, implement, and continuously improve their own lifelong learning process by consciously identifying developmental needs and selecting effective strategies for enhancing professional and scientific competencies, as well as guide others in planning and improving the learning process and providing constructive feedback.	P7U_U	P7S_UU
9	2BIO8	Is prepared to critically evaluate and recognize the importance of advanced specialized knowledge in solving cognitive and practical problems specific to food, industrial, and environmental biotechnology, and to seek expert advice when facing difficulties in independently resolving complex research or technological problems.	P7U_K	P7S_KK
10	2BIO9	Is prepared to assume a leading role in initiatives promoting biotechnology, including modern experimental and molecular biology technologies, by combining an entrepreneurial approach with a commitment to social engagement, sustainable development, and the public interest.	P7U_K	P7S_KO

Matrix of course modules in relation to learning outcomes and curriculum content

No.	Course name	Program content	2BIO1	2BIO10	2BIO2	2BIO3	2BIO4	2BIO5	2BIO6	2BIO7	2BIO8	2BIO9
1	Dynamics and scaling-up of biotechnological processes											
2	Omics systems and data analysis											
3	Internship in industrial plants											
4	Internship in scientific and research institutions	Practical application of knowledge acquired during studies in real research work conditions in scientific research institutions operating in the field of biotechnology. Familiarization with the course of research, stages of planning and conducting experiments, operation of laboratory equipment, analysis and interpretation of results, research documentation, occupational health and safety regulations, and teamwork principles.		x			x		x	x		x
5	Biotechnologist in business - market, company, career			x	x	x		x		x		
6	Science and ethics workshops											
7	Advanced nutrigenomics											
8	Advanced strategies for biomolecule purification											
9	Techniques of biomolecules analysis											
10	Innovations in biotechnology		x			x	x	x				
11	AI in biotechnology											
12	Functional and structural bioinformatics											
13	Biomaterials Functionalization											
14	Molecular engineering and protein crystallography											
15	Biotransformations for a sustainable industry											

No.	Course name	Program content	2BIO1	2BIO10	2BIO2	2BIO3	2BIO4	2BIO5	2BIO6	2BIO7	2BIO8	2BIO9
16	Animal cells in molecular analysis											
17	Biological activity of phytochemicals											
18	Applied Immunology											
19	Molecular diagnostics in biotechnology											
20	Pre-graduate project											
21	Foreign Language for Specialist Purposes											
22	Diploma Seminar											
23	Final Project											
24	Analysis and presentation of experimental data		x			x	x				x	
25	Commercialization and certification of products											
26	Advanced technologies of alcoholic beverages production		x	x			x	x	x			
27	Molecular biology of microorganisms											
28	New trends in yeast and bakery technology											
29	Lactic Acid Bacteria in the Food Industry											
30	Yeasts in Sustainable Feed Production											
31	Pathogenesis of microorganisms											
32	Bioconversion of agri-food industry waste											
33	Microbiological analytics											
34	Application of legal acts											
35	Yeast as dietary supplements											
36	Current trends in the analysis and quality assessment of alcoholic beverages											

No.	Course name	Program content	2BIO1	2BIO10	2BIO2	2BIO3	2BIO4	2BIO5	2BIO6	2BIO7	2BIO8	2BIO9
37	Improvement of industrial strains											
38	Innovations in fermented food and beverages production											
39	Pre-graduate project											
40	Diploma Seminar	Rules for writing a thesis: structure, scientific language, citations and bibliography. Literature review and formulation of the research problem. Documentation and presentation of methodological assumptions. Data analysis, interpretation of results, drawing conclusions. Participation in scientific discussions and defence of one's own concepts. Trial competency exam.			x	x		x			x	x
41	Final Project											
42	Analysis and presentation of experimental data		x			x	x				x	
43	Climate biotechnology											
44	Legal and economic aspects of the environment		x			x	x					
45	Environmental monitoring		x			x	x					
46	Algologia środowiskowa		x			x	x	x				
47	Materiały funkcjonalne i bioaktywne		x			x	x	x				
48	Designing biopreparations		x	x		x	x					
49	Artificial intelligence in environmental biotechnology											
50	Energy biotechnology											
51	Environmental toxicology											
52	Biodiversity and Biocontrol											
53	Profiling Beneficial Microorganisms											

No.	Course name	Program content	2BIO1	2BIO10	2BIO2	2BIO3	2BIO4	2BIO5	2BIO6	2BIO7	2BIO8	2BIO9
54	Circular economy in biotechnology		x			x	x	x			x	
55	Biomass valorisation and bioconversion		x			x	x	x			x	
56	Pre-graduate project											
57	Final Project		x			x	x		x		x	x
58	Diploma Seminar				x	x		x			x	x
59	Optimisation methods in biotechnology											

ECTS - subjects

No.	Course name	ECTS	Subjects in the field of humanities and social sciences	Elective subjects	Profile items	Classes in a foreign language
1	Dynamics and scaling-up of biotechnological processes	5			5	
2	Omics systems and data analysis	5			5	
3	Internship in industrial plants	4		4		
4	Internship in scientific and research institutions	4		4		
5	Biotechnologist in business - market, company, career	3	3	3		
6	Science and ethics workshops	3	3	3		
7	Advanced nutrigenomics	6			6	
8	Advanced strategies for biomolecule purification	4		4	4	
9	Techniques of biomolecules analysis	4		4	4	
10	Innovations in biotechnology	3		3	3	3
11	AI in biotechnology	3		3	3	3
12	Functional and structural bioinformatics	5		5	5	
13	Biomaterials Functionalization	5		5	5	
14	Molecular engineering and protein crystallography	7			7	
15	Biotransformations for a sustainable industry	5			5	
16	Animal cells in molecular analysis	4		4	4	
17	Biological activity of phytocompounds	4		4	4	
18	Applied Immunology	5		5	5	
19	Molecular diagnostics in biotechnology	5		5	5	
20	Pre-graduate project	2			2	

No.	Course name	ECTS	Subjects in the field of humanities and social sciences	Elective subjects	Profile items	Classes in a foreign language
21	Foreign Language for Specialist Purposes	2				
22	Diploma Seminar	5			5	
23	Final Project	20		20	20	
24	Analysis and presentation of experimental data	3			3	
25	Commercialization and certification of products	2				
26	Advanced technologies of alcoholic beverages production	6			6	
27	Molecular biology of microorganisms	4		4	4	
28	New trends in yeast and bakery technology	4		4	4	
29	Lactic Acid Bacteria in the Food Industry	3		3	3	3
30	Yeasts in Sustainable Feed Production	3		3	3	3
31	Pathogenesis of microorganisms	5		5	5	
32	Bioconversion of agri-food industry waste	5		5	5	
33	Microbiological analytics	7			7	
34	Application of legal acts	5			5	
35	Yeast as dietary supplements	4		4	4	
36	Current trends in the analysis and quality assessment of alcoholic beverages	4		4	4	
37	Improvement of industrial strains	5		5	5	
38	Innovations in fermented food and beverages production	5		5	5	
39	Pre-graduate project	2			2	
40	Diploma Seminar	5			5	
41	Final Project	20		20	20	

No.	Course name	ECTS	Subjects in the field of humanities and social sciences	Elective subjects	Profile items	Classes in a foreign language
42	Analysis and presentation of experimental data	3			3	
43	Climate biotechnology	6			6	
44	Legal and economic aspects of the environment	4		4	4	
45	Environmental monitoring	4		4	4	
46	Algologia środowiskowa	3		3	3	3
47	Materiały funkcjonalne i bioaktywne	3		3	3	3
48	Designing biopreparations	5		5	5	
49	Artificial intelligence in environmental biotechnology	5		5	5	
50	Energy biotechnology	7			7	
51	Environmental toxicology	5			5	
52	Biodiversity and Biocontrol	4		4	4	
53	Profiling Beneficial Microorganisms	4		4	4	
54	Circular economy in biotechnology	5		5	5	
55	Biomass valorisation and bioconversion	5		5	5	
56	Pre-graduate project	2			2	
57	Final Project	20		20	20	
58	Diploma Seminar	5			5	
59	Optimisation methods in biotechnology	3			3	

ECTS indicators

Name	brak	brak	brak
The total number of ECTS credits that a student must obtain through elective courses (amounting to no less than 30% of the total ECTS credits required to obtain the qualification corresponding to the given level of study)	48/90 (53.33%)	48/90 (53.33%)	48/90 (53.33%)
The total number of ECTS credits to be earned by a student through courses in the fields of humanities or social sciences	0	0	0
The total number of ECTS credits that a student must obtain from courses related to research conducted at the university, amounting to more than 50% of the total ECTS credits required to graduate from a given level of study	79/90 (87.78%)	79/90 (87.78%)	79/90 (87.78%)

Methods of verifying and assessing learning outcomes

The study program is based on knowledge derived from achievements in the biological, chemical, natural, and engineering sciences, including the latest technological solutions in biotechnology. The verification and assessment of program learning outcomes achieved by students are carried out with reference to the learning outcomes defined for individual courses/modules and internships, as specified in the course descriptions according to the type of outcome (knowledge, skills, social competences) and the nature of the course/module or internship.

Methods for verifying the intended learning outcomes depend on the course delivery mode and the instructor's individual requirements. In lectures, tutorial classes, and laboratory classes, verification may take the form of written examinations, individual oral examinations, report preparation, or problem-solving tasks. During laboratory classes, students are also assessed on their manual skills, the correctness of their analyses, the quality of their preparations and the products obtained, as well as their ability to work in a team. In seminars, learning outcomes are verified through the assessment of the quality and form of presentations and students' participation in discussions. The final verification of learning outcomes leading to the achievement of the intended competences is conducted through the diploma thesis.

Learning outcomes at lower levels of the cognitive domain (knowledge and comprehension) are assessed through written and oral examinations (open-ended and multiple-choice tests, essays, and individual interviews). Additional methods used to verify learning outcomes related to higher levels of the cognitive domain (application, analysis, synthesis, and creation) include project assignments, comparative analyses, and case studies. Skills related to the psychomotor domain are verified through observation, assessment of the correctness of performed analyses, evaluation of the quality of student-prepared materials, and assessment of the proper assembly and operation of research equipment. Skills related to the affective domain (attitudes and values) are assessed through the evaluation of teamwork and participation in discussions.

Methods for verifying learning outcomes achieved during internships are specified in the course syllabuses and internship regulations. The practical component of the educational process (professional internships) primarily enables the verification of students' practical skills and social competences, while knowledge is assessed to a lesser extent.

The verification of learning outcomes acquired during internships is carried out by the internship supervisor responsible for a given specialization and/or the Dean's Representative for Professional Internships, in consultation with representatives of the institutions where the internship takes place. The assessment is based on the opinion of the workplace internship supervisor and the student's submitted report.

Detailed methods for verifying and assessing learning outcomes are specified in the course syllabi and are consistent with the requirements for obtaining course credits, as described in the Study Regulations of Lodz University of Technology.

Professional internships

Duration: 4 weeks

ECTS credits obtained: 4

Internships are carried out in accordance with the study program, in a form adapted to the profile and specifics of the field of study, and according to the rules established by the faculty and the University.

Specializations/degree paths offered within the study program

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Characteristics of the course

Graduate profile

A graduate of the second-cycle degree program in Biotechnology is awarded the Master's degree and possesses extensive knowledge and skills in the fields of molecular, industrial, and environmental biotechnology. The graduate also has competences in bioinformatics and molecular diagnostics applied in food production, the development of therapeutics, and plant and environmental protection.

The graduate is prepared to design, optimize, control, and comprehensively analyze biotechnological processes to produce products with desired properties and applications, while taking into account the principles of sustainable development. They are capable of independently planning and conducting scientific research, solving research problems using modern biological, chemical, and molecular analytical methods, and operating specialized research equipment.

The graduate understands the ecological, social, legal, and economic aspects of biotechnological activities and is familiar with legal regulations concerning business activities in this field. They can discuss scientific issues with specialists from various disciplines, work effectively in teams, and lead groups conducting research and technological tasks.

The graduate can efficiently use specialized literature, including legal acts and industry-related documents. In their professional activities, they adhere to professional ethics and demonstrate concern for the natural environment.

Thanks to the acquired competences, the graduate can effectively apply innovative technologies and the latest advances in contemporary experimental biology in both industrial practice and scientific research. They may further develop their professional skills through postgraduate studies and professional courses within both national and international labor markets, as well as continue their education in third-cycle studies within a doctoral school.

The relationship between the field of study and the university's strategy

The Biotechnology degree program is closely aligned with the University's mission and strategy through a modern curriculum that integrates extensive knowledge, practical skills, and social competencies. Ensuring high-quality education within the Biotechnology programme is one of the Faculty's priorities and is achieved, among others, through: a staffing policy aimed at employing the most highly qualified academic teachers, actively engaged in research conducted at the highest level, to deliver teaching activities; continuous improvement of the teaching competences of academic staff through the ongoing development of skills related to modern teaching methods, up-to-date knowledge, technological advances, and current trends in science; the continuous enhancement of the educational offer, including supplementary forms of education, in response to the challenges posed by the socio-economic environment; and the development of student-friendly educational, infrastructural, and support facilities.

The curriculum, designed to address the current needs of a rapidly changing labor market, has high application potential. It enables not only the improvement of existing technologies and products but also the creation—often in accordance with the principles of sustainable development—of entirely new biotechnological solutions.

The scientific activity of students is reflected in their participation in research projects conducted at the Faculty, which often results in co-authorship of scientific publications and patent applications. The study program also provides opportunities for individualizing the educational pathway for outstanding students, thereby supporting the development of their research and professional potential.

Modern forms of education, including active cooperation with industrial and business partners, enable students to acquire valuable practical competences and prepare them for employment in highly specialized sectors of the knowledge-based economy.

Educational objectives and employment and continuing education opportunities

The Biotechnology degree program aims to equip graduates with comprehensive theoretical knowledge and practical skills for employment in the biotechnology industry and related sectors that utilize biotechnological processes or products. Key areas of application include the food, feed, pharmaceutical, and household chemicals industries, as well as sectors connected to agriculture, healthcare, and environmental protection.

Continuous curriculum development and active participation of students and academic staff in research projects funded by the University, public administration, and international programs support the achievement of these objectives. This strategy ensures that graduates possess both a strong theoretical foundation and substantial practical research experience.

Graduates are qualified for positions in research and diagnostic laboratories, as well as research and development facilities within the biotechnology industry and related sectors. They are also well prepared for employment in scientific institutions. Graduates demonstrate organizational and leadership abilities, problem-solving skills in both technical and interpersonal contexts, and the capacity to collaborate effectively in international environments. They apply an interdisciplinary approach, integrating knowledge from multiple scientific disciplines.

Graduates of the second-cycle degree program are highly prepared to operate at the intersection of innovative technologies and advanced experimental biology methods, engaging in both analytical and research and development activities. They collaborate effectively with specialists from related disciplines in industrial and scientific contexts.

Graduates may further enhance their professional competencies through postgraduate studies, professional courses, or by pursuing third-cycle education within a doctoral school.

Description of the process and outcome of consultations on the proposed study program with the socio-economic environment

Description of competencies expected from a candidate applying for admission to studies

In accordance with the recruitment resolution in force for a given academic year.

The unit organizing education

Faculty of Biotechnology and Food Sciences

Education program

Semester 1

Course	Number of hours	ECTS points	Form of verification	Obligatory
Dynamics and scaling-up of biotechnological processes	Tutorials: 10 Laboratory classes: 30 Project work: 15 Lecture: 15	5	Exam	Obligatory
Omics systems and data analysis	Laboratory classes: 30 Project work: 20 Lecture: 20	5	Exam	Obligatory
Elective Student Internships		4	Pass	Obligatory group
The student chooses 1 subject				
Internship in industrial plants	Internship: 0	4	Pass	Optional
Internship in scientific and research institutions	Internship: 0	4	Pass	Optional
Elective Course 1		3	Graded assignment	Obligatory group
The student chooses 1 subject				
Biotechnologist in business – market, company, career	Project work: 30	3	Graded assignment	Optional
Science and ethics workshops	Project work: 30	3	Graded assignment	Optional
Sum	170	17		

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Course	Number of hours	ECTS points	Form of verification	Obligatory
Advanced nutrigenomics	Laboratory classes: 30 Project work: 25 Lecture: 20	6	Exam	Obligatory
Elective Course 1		4	Graded assignment	Obligatory group

Course	Number of hours	ECTS points	Form of verification	Obligatory
The student chooses 1 subject				
Advanced strategies for biomolecule purification	Laboratory classes: 30 Project work: 15 Lecture: 15	4	Graded assignment	Optional
Techniques of biomolecules analysis	Laboratory classes: 30 Project work: 15 Lecture: 15	4	Graded assignment	Optional
Elective Courses 2		3	Graded assignment	Obligatory group
The student chooses 1 subject				
Innovations in biotechnology	Lecture: 15 E-learning: 30	3	Graded assignment	Optional
AI in biotechnology	Lecture: 15 E-learning: 30	3	Graded assignment	Optional
Sum	180	13		

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Course	Number of hours	ECTS points	Form of verification	Obligatory
Advanced technologies of alcoholic beverages production	Laboratory classes: 60 Project work: 15 Lecture: 45	6	Exam	Obligatory
Elective Course 1		4	Graded assignment	Obligatory group
The student chooses 1 subject				
Molecular biology of microorganisms	Laboratory classes: 20 Lecture: 10	4	Graded assignment	Optional
New trends in yeast and bakery technology	Laboratory classes: 20 Lecture: 10	4	Graded assignment	Optional
Elective Courses 2		3	Graded assignment	Obligatory group
The student chooses 1 subject				

Course	Number of hours	ECTS points	Form of verification	Obligatory
Lactic Acid Bacteria in the Food Industry	Laboratory classes: 15 Lecture: 15	3	Graded assignment	Optional
Yeasts in Sustainable Feed Production	Laboratory classes: 15 Lecture: 15	3	Graded assignment	Optional
Sum	180	13		

brak

Course	Number of hours	ECTS points	Form of verification	Obligatory
Climate biotechnology	Project work: 45 Lecture: 20	6	Exam	Obligatory
Elective Course 1		4	Graded assignment	Obligatory group
The student chooses 1 subject				
Legal and economic aspects of the environment	Tutorials: 15 Project work: 30 Lecture: 15	4	Graded assignment	Optional
Environmental monitoring	Laboratory classes: 15 Project work: 30 Lecture: 15	4	Graded assignment	Optional
Elective Courses 2		3	Graded assignment	Obligatory group
The student chooses 1 subject				
Algologia środowiskowa	Laboratory classes: 30 Project work: 15 Lecture: 10	3	Graded assignment	Optional
Materiały funkcjonalne i bioaktywne	Laboratory classes: 30 Project work: 15 Lecture: 10	3	Graded assignment	Optional
Sum	180	13		

Semester 2

Course	Number of hours	ECTS points	Form of verification	Obligatory
Foreign Language for Specialist Purposes	Tutorials: 45	2	Graded assignment	Obligatory
Sum	45	2		

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Course	Number of hours	ECTS points	Form of verification	Obligatory
Elective Courses 3		5	Graded assignment	Obligatory group
The student chooses 1 subject				
Functional and structural bioinformatics	Laboratory classes: 15 Project work: 10 Lecture: 15	5	Graded assignment	Optional
Biomaterials Functionalization	Laboratory classes: 15 Project work: 10 Lecture: 15	5	Graded assignment	Optional
Molecular engineering and protein crystallography	Laboratory classes: 45 Project work: 10 Lecture: 25	7	Exam	Obligatory
Biotransformations for a sustainable industry	Laboratory classes: 60 Lecture: 10	5	Exam	Obligatory
Elective Courses 4		4	Graded assignment	Obligatory group
The student chooses 1 subject				
Animal cells in molecular analysis	Laboratory classes: 30 Project work: 15 Lecture: 15	4	Graded assignment	Optional
Biological activity of phytocompounds	Laboratory classes: 30 Project work: 15 Lecture: 15	4	Graded assignment	Optional

Course	Number of hours	ECTS points	Form of verification	Obligatory
Elective Courses 5		5	Graded assignment	Obligatory group
The student chooses 1 subject				
Applied Immunology	Laboratory classes: 15 Project work: 10 Lecture: 15	5	Graded assignment	Optional
Molecular diagnostics in biotechnology	Laboratory classes: 15 Project work: 10 Lecture: 15	5	Graded assignment	Optional
Pre-graduate project	Project work: 15	2	Graded assignment	Obligatory
Sum	305	28		

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Course	Number of hours	ECTS points	Form of verification	Obligatory
Elective Courses 3		5	Graded assignment	Obligatory group
The student chooses 1 subject				
Pathogenesis of microorganisms	Project work: 15 Lecture: 30	5	Graded assignment	Optional
Bioconversion of agri-food industry waste	Project work: 15 Laboratory classes: 15 Lecture: 15	5	Graded assignment	Optional
Microbiological analytics	Laboratory classes: 85 Lecture: 15	7	Exam	Obligatory
Application of legal acts	Project work: 20 Lecture: 20	5	Exam	Obligatory
Elective Courses 4		4	Graded assignment	Obligatory group
The student chooses 1 subject				

Course	Number of hours	ECTS points	Form of verification	Obligatory
Yeast as dietary supplements	Laboratory classes: 20 Project work: 10 Lecture: 5	4	Graded assignment	Optional
Current trends in the analysis and quality assessment of alcoholic beverages	Laboratory classes: 30 Lecture: 5	4	Graded assignment	Optional
Elective Courses 5		5	Graded assignment	Obligatory group
The student chooses 1 subject				
Improvement of industrial strains	Laboratory classes: 30 Project work: 25 Lecture: 15	5	Graded assignment	Optional
Innovations in fermented food and beverages production	Laboratory classes: 45 Project work: 5 Lecture: 20	5	Graded assignment	Optional
Pre-graduate project	Project work: 15	2	Graded assignment	Obligatory
Sum	305	28		

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Course	Number of hours	ECTS points	Form of verification	Obligatory
Elective Courses 3		5	Graded assignment	Obligatory group
The student chooses 1 subject				
Designing biopreparations	Project work: 45	5	Graded assignment	Optional
Artificial intelligence in environmental biotechnology	Project work: 45	5	Graded assignment	Optional
Energy biotechnology	Laboratory classes: 45 Project work: 15 Lecture: 20	7	Exam	Obligatory
Environmental toxicology	Laboratory classes: 30 Project work: 15 Lecture: 20	5	Exam	Obligatory

Course	Number of hours	ECTS points	Form of verification	Obligatory
Elective Courses 4		4	Graded assignment	Obligatory group
The student chooses 1 subject				
Biodiversity and Biocontrol	Laboratory classes: 45 Lecture: 5	4	Graded assignment	Optional
Profiling Beneficial Microorganisms	Laboratory classes: 45 Lecture: 5	4	Graded assignment	Optional
Elective Courses 5		5	Graded assignment	Obligatory group
The student chooses 1 subject				
Circular economy in biotechnology	Seminar: 15 Laboratory classes: 30 Lecture: 5	5	Graded assignment	Optional
Biomass valorisation and bioconversion	Seminar: 15 Laboratory classes: 30 Lecture: 5	5	Graded assignment	Optional
Pre-graduate project	Project work: 15	2	Graded assignment	Obligatory
Sum	305	28		

Semester 3

Course	Number of hours	ECTS points	Form of verification	Obligatory
Commercialization and certification of products	Project work: 30 Lecture: 10	2	Graded assignment	Obligatory
Sum	40	2		

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Course	Number of hours	ECTS points	Form of verification	Obligatory
Diploma Seminar	Seminar: 30	5	Graded assignment + exam	Obligatory
Final Project	Diploma Thesis: 0	20	Pass	Obligatory subjects to choose from
Analysis and presentation of experimental data	Tutorials: 25 Laboratory classes: 10 Lecture: 15	3	Exam	Obligatory
Sum	80	28		

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Course	Number of hours	ECTS points	Form of verification	Obligatory
Diploma Seminar	Seminar: 30	5	Graded assignment + exam	Obligatory
Final Project	Diploma Thesis: 0	20	Pass	Obligatory subjects to choose from
Analysis and presentation of experimental data	Tutorials: 25 Laboratory classes: 10 Lecture: 15	3	Exam	Obligatory
Sum	80	28		

brak

Course	Number of hours	ECTS points	Form of verification	Obligatory
Final Project	Diploma Thesis: 0	20	Pass	Obligatory subjects to choose from
Diploma Seminar	Seminar: 30	5	Graded assignment + exam	Obligatory

Course	Number of hours	ECTS points	Form of verification	Obligatory
Optimisation methods in biotechnology	Tutorials: 25 Project work: 15 Lecture: 10	3	Exam	Obligatory
Sum	80	28		