Course: **BIOLOGY**

Profile **– general academic profile**

Level of study: **first cycle**

Field: **natural sciences*, discipline:* biological sciences - *100%.***

Level of Polish Qualifications Framework **– level 6**

Symbols of learning outcomes	Learning outcomes	Reference to universal PQF descriptors	Reference to second-cycle PQF descriptors for a relevant level
1	2	3	4
	KNOWLEDGE: THE GRADUATE KNOWS AND UNDERSTANDS	**Descriptor code**	**Descriptor code**
K_W01	The graduate has advanced knowledge and understanding of facts, concepts, objects, phenomena, and complex relationships between them as well as explanatory theories, which constitute the basic general knowledge in the scope of the scientific disciplines, primarily exact and natural sciences, forming the theoretical basis of biology	P6U_W	P6S_WG
K_W02	The graduate knows and understands the basic research, laboratory, and field methods and techniques used in modern biology	P6U_W	P6S_WG
K_W03	The graduate has advanced knowledge and understanding of the relationships between biology and other natural science disciplines, which reveal the principles of functioning of organisms and help to interpret and generalize acquired knowledge	P6U_W	P6S_WG
K_W04	The graduate has advanced knowledge and understanding of selected biology-specific issues that are part of advanced detailed knowledge, including basic processes occurring at the molecular, cellular, and organism levels and the relationships between organisms and the environment	P6U_W	P6S_WG
K_W05	The graduate has advanced knowledge and understanding of the rationale behind activities undertaken for preservation of biodiversity as a prerequisite for maintenance of balance in the biosphere and as a source of biological material for practical applications	P6U_W	P6S_WG
K_W06	The graduate has advanced knowledge and understanding of the specificity of biology, its development trends, and selected achievements as well as the possibilities of practical applications of biological knowledge, especially in the field of applied biology, in socio-economic life	P6U_W	P6S_WG
K_W07	The graduate knows and understands the principles of mathematical description, calculation methods, IT techniques, and statistical interpretation of results as well as their importance for characterization of phenomena and processes at various levels of organization of the living world	P6U_W	P6S_WG
K_W08	The graduate knows and understands the fundamental dilemmas of modern civilization and their basic implications in relation to biological scientific research	P6U_W	P6S_WK
K_W09	The graduate knows and understands the basic economic, legal, and ethical regulations of scientific research activities and	P6U_W	P6S_WK

	applications related to biology, including the basic concepts and principles of intellectual and industrial property protection		
K_W10	The graduate knows and understands the basic principles of creation and development of various forms of entrepreneurship, including individual initiatives, based on knowledge of applied biology and general knowledge of biotechnological processes	P6U_W	P6S_WK
	SKILLS: THE GRADUATE IS ABLE TO	**Descriptor code**	**Descriptor code**
K_U01	The graduate is able to formulate and solve untypical and complex problems, evaluate facts critically, draw relevant conclusions, and perform various tasks in variable and not fully predictable conditions	P6U_U	P6S_UW
K_U02	The graduate is able to select data resources properly and conduct critical analysis, assessment, and synthesis of information contained therein to solve problems and perform assigned tasks	P6U_U	P6S_UW
K_U03	The graduate is able to select properly and apply appropriate research methods and tools and to present the results of experiments or observations and conclusions, including those formulated after analysis of scientific literature, in a written and oral form using advanced information and communication techniques	P6U_U	P6S_UW
K_U04	The graduate is able to carry out experiments, observations, and measurements with the use of adequate research, laboratory, and/or field methods and tools and to interpret study results and formulate conclusions based on acquired data	P6U_U	P6S_UW
K_U05	The graduate is able to communicate with the milieu using specialized terminology from the field of biology and related natural sciences and to participate in debates properly presenting and justifying his/her standpoint and assessing different opinions and viewpoints expressed in discussions	P6U_U	P6S_UK
K_U06	The graduate is able to use a foreign language at the B2 level of the Common European Framework of Reference for Languages	P6U_U	P6S_UK
K_U07	The graduate is able to plan and organize individual and team work aimed at efficient solution of problems and completion of assigned tasks	P6U_U	P6S_UO
K_U08	The graduate is able to cooperate with other researchers as part of team activities, including work on interdisciplinary tasks	P6U_U	P6S_UO
K_U09	The graduate is able to design and implement lifelong learning by choosing the range of study problems consistent with his/her interests and future occupational and/or scientific activities	P6U_U	P6S_UU
	SOCIAL COMPETENCE: THE GRADUATE IS READY TO	**Descriptor code**	**Descriptor code**
K_K01	The graduate is ready to respect and disseminate patterns of proper conduct inside and outside the work milieu, make independent decisions, assess critically own activities as well as the activities of teams and organizations to which he/she belongs, and take responsibility for the effects of these activities	P6U_K	P6S_KK
K_K02	The graduate is ready to assess his/her knowledge and acquired information critically, recognize the importance of general and specialist knowledge in the field of biology in solving theoretical and practical problems, and seek expert opinions in the case of difficulties in solving problems independently	P6U_K	P6S_KK
K_K03	The graduate is ready to fulfill social obligations, such as sharing biological knowledge with others and co-organizing activities for the benefit of the social milieu	P6U_K	P6S_KO
K_K04	The graduate is able to initiate actions for the benefit of public interest as well as think and act in a resourceful manner	P6U_K	P6S_KO
K_K05	The graduate is ready to perform occupational roles responsibly, e.g. to comply with the principles of professional ethics and require such compliance from other team members	P6U_K	P6S_KR
K_K06	The graduate is ready to exercise care of the achievements and traditions of the biologist profession	P6U_K	P6S_KR

Course: **BIOLOGY**

Profile **– general academic profile**

Level of study: **second cycle**

Field: **natural sciences*, discipline:* biological sciences - 100 %**

Level of Polish Qualifications Framework **– level 7**

Symbols of learning outcomes	Learning outcomes	Reference to universal PQF descriptors	Reference to second-cycle PQF descriptors for a relevant level
1	2	3	4
	KNOWLEDGE: THE GRADUATE KNOWS AND UNDERSTANDS	**Descriptor code**	**Descriptor code**
K_W01	The graduate has profound knowledge and understanding of selected facts, objects, phenomena, and relevant methods used in the field of biology and theories explaining the complex relationships between them, also with reference to other fields of science	P7U_W	P7S_WG
K_W02	The graduate has profound knowledge and understanding of the theoretical basics of biology based on advanced general knowledge, has structured knowledge of key issues in biology, and recognizes and understands selected specific issues that are part of advanced detailed knowledge	P7U_W	P7S_WG
K_W03	The graduate knows and understands the complex processes occurring in the living world at different levels of organization and has comprehensive knowledge of the interactions and relationships occurring at different levels in the biosphere	P7U_W	P7S_WG
K_W04	The graduate knows and understands the basics of methodology used in natural sciences, the principles of planning and conducting biological experiments or observations, and rules of formulation of appropriate conclusions describing and interpreting natural phenomena and processes	P7U_W	P7S_WG
K_W05	The graduate has profound knowledge and understanding of the specificity of biology as well as the main development trends and the latest achievements of this science, including significant accomplishments for the human, economy, and environment	P7U_W	P7S_WG
K_W06	The graduate knows and understands the fundamental dilemmas of modern civilization and their implications in relation to biological sciences	P7U_W	P7S_WK
K_W07	The graduate knows and understands the complex ethical, legal, and economic regulations of scientific research, didactic, and application-related activities associated with biology, including the principles of copyright and industrial property protection, and knows and understands the basic principles of creation and development of individual entrepreneurship	P7U_W	P7S_WK

	SKILLS: THE GRADUATE IS ABLE TO	Descriptor code	Descriptor code
K_U01	The graduate is able to formulate unusual and complex problems in the field of biology and solve problems in an innovative way in unpredictable conditions, including situations requiring independent decision-making	P7U_U	P7S_UW
K_U02	The graduate is able to choose and employ appropriate methods and tools to perform specific tasks and modify available methods or develop new methodologies and tools	P7U_U	P7S_UW
K_U03	The graduate is able to use information sources properly, evaluate and analyze data critically, synthesize and interpret data creatively, and present research results as well as interpretation and conclusions in a written and oral form using advanced information and communication techniques	P7U_U	P7S_UW
K_U04	The graduate is able to formulate and test hypotheses related to simple research problems in the field of biology	P7U_U	P7S_UW
K_U05	The graduate is able to design and conduct experiments and observations, make measurements with the use of advanced research tools, interpret research results, and draw conclusions based on relevant scientific literature	P7U_U	P7S_UW
K_U06	The graduate is able to disseminate specialized biological topics with diverse audiences, properly justify his/her opinions and standpoints, and lead a debate on a given issue	P7U_U	P7S_UK
K_U07	The graduate is able to use a foreign language at the B2 level of the Common European Framework of Reference for Languages and knows specialized biological terminology	P7U_U	P7S_UK
K_U08	The graduate is able to collaborate with other research team members, take a leading role in research teams, and manage the work of the team on the design and performance of various tasks in the field of biology	P7U_U	P7S_UO
K_U09	The graduate is able to make independent decisions about the design and implementation of research, having in mind his/her future occupational career, and guide others in this regard	P7U_U	P7S_UU
	SOCIAL COMPETENCE: THE GRADUATE IS READY TO	**Descriptor code**	**Descriptor code**
K_K01	The graduate is ready to design and develop patterns of proper conduct in the work and life environment, take the initiative, and critically assess himself/herself as well as teams and organizations to which he/she belongs	P7U_K	P7S_KK
K_K02	The graduate is ready to be the head of a team and take responsibility for the team and the decisions made	P7U_K	P7S_KK
K_K03	The graduate is ready to assess his/her knowledge and acquired information critically, recognize the importance of knowledge of biology as well as related sciences and other fields in solving theoretical and practical problems, and seek expert opinions in the case of difficulties in solving problems independently	P7U_K	P7S_KK
K_K04	The graduate is ready to fulfill social obligations, such as sharing specialist biological knowledge with others as well as initiating and co-organizing activities for the benefit of the social milieu	P7U_K	P7S_KO
K_K05	The graduate is ready to initiate actions for the benefit of public interest as well as think and act in a resourceful manner	P7U_K	P7S_KO
K_K06	The graduate is ready to develop the achievements and uphold the ethos of the biologist profession, comply with and develop principles of professional ethics, and support compliance with these principles taking into account changing societal needs	P7U_K	P7S_KR

Course: **BIOTECHNOLOGY**

Profile **– general academic profile**

Level of study: **first cycle**

Field: **natural sciences*****, discipline:*** **biological sciences -** ***100%***

Level of Polish Qualifications Framework **–level 6**

Symbols of learning outcomes	Learning outcomes	Reference to universal PQF descriptors	Reference to second-cycle PQF descriptors for a relevant level
1	2	3	4
	KNOWLEDGE: THE GRADUATE KNOWS AND UNDERSTANDS	**Descriptor code**	**Descriptor code**
K_W01	The graduate has advanced knowledge and understanding of selected concepts, facts, objects, and phenomena as well as theories explaining the complex relationships between them, including basic general knowledge of theoretical foundations of biotechnology, primarily exact and natural sciences	P6U_W	P6S_WG
K_W02	The graduate has advanced knowledge and understanding of selected biotechnology-specific issues that are part of advanced detailed knowledge, including the basics of biotechnological processes, life processes, properties of studied organisms, as well as research tools and techniques used	P6U_W	P6S_WG
K_W03	The graduate has advanced knowledge and understanding of the relationships between biotechnology and related sciences, which facilitate analysis and design of biotechnological processes	P6U_W	P6S_WG
K_W04	The graduate has advanced knowledge and understanding of basic phenomena and processes occurring at the molecular, cellular and organism levels, and the relationships between the living environment of organisms and their products	P6U_W	P6S_WG
K_W05	The graduate knows and understands problems associated with manufacture of specific products using biotechnological methods, including large-scale production of biologically active compounds	P6U_W	P6S_WG
K_W06	The graduate has advanced knowledge and understanding of the specificity of biotechnology and its selected findings and current development trends, including those with great importance for medicine, various industries, agriculture, and environmental protection	P6U_W	P6S_WG
K_W07	The graduate knows and understands the basics of mathematical and statistical methods as well as information technologies facilitating adequate description and analysis of biotechnological processes and natural phenomena	P6U_W	P6S_WG
K_W08	The graduate knows and understands the fundamental dilemmas of modern civilization and their basic implications for biotechnological research, including the use of genetically modified organisms and *in vitro* techniques	P6U_W	P6S_WK
K_W09	The graduate knows and understands the basic economic, legal, and ethical regulations of scientific research and implementation activities related to biotechnology, including basic concepts and principles of copyright and industrial property protection	P6U_W	P6S_WK

K_W10	The graduate knows and understands the basic principles of creation and development of various forms of entrepreneurship, including individual initiatives, based on knowledge of biotechnology	P6U_W	P6S_WK
	SKILLS: THE GRADUATE IS ABLE TO	**Descriptor code**	**Descriptor code**
K_U01	The graduate is able to use newly acquired knowledge of biotechnology and related sciences for innovative implementation of tasks and formulate and solve complex and untypical problems in variable and not fully predictable conditions	P6U_U	P6S_UW
K_U02	The graduate is able to select properly and use sources of scientific information, conduct critical analysis, assessment, and synthesis of data contained therein to formulate and solve problems	P6U_U	P6S_UW
K_U03	The graduate is able to select properly and use adequate tools and methods for design and comprehensive solution of research tasks and present results and conclusions in a written or oral form using advanced information and communication techniques	P6U_U	P6S_UW
K_U04	The graduate is able to conduct experiments and measurements using appropriate methods and research tools, interpret research results, and formulate conclusions based on his/her knowledge	P6U_U	P6S_UW
K_U05	The graduate is able to communicate with the milieu using specialized terminology from the field of biotechnology and related natural sciences and to participate in debates adequately justifying his/her standpoint and assessing different opinions and viewpoints expressed in discussions	P6U_U	P6S_UK
K_U06	The graduate is able to use a foreign language at the B2 level of the Common European Framework of Reference for Languages	P6U_U	P6S_UK
K_U07	The graduate is able to plan and organize independent and team work for effective fulfillment of assigned tasks	P6U_U	P6S_UO
K_U08	The graduate is able to cooperate with other researchers as part of team activities, including work on interdisciplinary tasks	P6U_U	P6S_UO
K_U09	The graduate is able to design and implement lifelong learning by choosing the range of research problems in agreement with his/her interests and future occupational and/or scientific activities	P6U_U	P6S_UU
	SOCIAL COMPETENCE: THE GRADUATE IS READY TO	**Descriptor code**	**Descriptor code**
K_K01	The graduate is ready to respect and disseminate patterns of proper conduct inside and outside the work milieu, make independent decisions, assess critically own activities as well as the activities of teams and organizations to which he/she belongs, and take responsibility for the effects of these activities	P6U_K	P6S_KK
K_K02	The graduate is ready to assess his/her knowledge and acquired information critically, recognize the importance of general and specialist biotechnological knowledge in solving theoretical and practical problems, and seek expert opinions in the case of difficulties in solving problems independently	P6U_K	P6S_KK
K_K03	The graduate is ready to fulfill social obligations, such as sharing biotechnological knowledge with others and co-organizing activities for the benefit of the social milieu	P6U_K	P6S_KO
K_K04	The graduate is able to initiate actions for the benefit of public interest as well as think and act in a resourceful manner	P6U_K	P6S_KO
K_K05	The graduate is ready to perform occupational roles responsibly, e.g. to comply with the principles of professional ethics and require such compliance from other team members	P6U_K	P6S_KR
K_K06	The graduate is ready to exercise care of the achievements and traditions of the biotechnologist profession	P6U_K	P6S_KR

Course: **BIOTECHNOLOGY**

Profile **– general academic**

Level of study: **second cycle**

Field: **natural sciences*, discipline:* biological sciences - *100%***

Level of Polish Qualifications Framework **–level 7**

Symbols of learning outcomes	Learning outcomes	Reference to universal PQF descriptors	Reference to second-cycle PQF descriptors for a relevant level
1	2	3	4
	KNOWLEDGE: THE GRADUATE KNOWS AND UNDERSTANDS	**Descriptor code**	**Descriptor code**
K_W01	The graduate has profound knowledge and understanding of selected facts, objects, phenomena, and relevant methods used in the field of biotechnology as well as theories explaining the complex relationships between them, also with reference to other fields of science	P7U_W	P7S_WG
K_W02	The graduate has profound knowledge and understanding of the theoretical basics of biotechnology based on advanced general knowledge, has structured knowledge of key issues in biology, and recognizes and understands selected specific issues of advanced detailed knowledge	P7U_W	P7S_WG
K_W03	The graduate knows and understands the course of various biotechnological processes and potential risks associated with these processes, including those associated with the use of genetically modified organisms	P7U_W	P7S_WG
K_W04	The graduate knows and understands the basics of the methodology of experimental work facilitating proper formulation and solution of biotechnological research problems, including the principles of design and implementation of investigations, selection of research methods and tools, and inference based on experiment results	P7U_W	P7S_WG
K_W05	The graduate has profound knowledge and understanding of the specificity of biotechnology and its main development trends and current findings with the application potential in medicine, industry, agriculture, and environmental protection	P7U_W	P7S_WG
K_W06	The graduate knows and understands the fundamental dilemmas of modern civilization and their implications in relation to techniques and tools used in modern biotechnology	P7U_W	P7S_WK
K_W07	The graduate knows and understands the complex economic, legal, and ethical regulations of scientific research and implementation activities in the field of biotechnology, including the principles of copyright and industrial property protection, and knows and understands the basic principles of creation and development of individual entrepreneurship	P7U_W	P7S_WK

	SKILLS: THE GRADUATE IS ABLE TO	Descriptor code	Descriptor code
K_U01	The graduate is able to formulate and solve complex and untypical research problems based on acquired knowledge, formulate correct conclusions, and solve various tasks in the field of biotechnology in unpredictable conditions in an innovative way	P7U_U	P7S_UW
K_U02	The graduate is able to select and use sources of scientific information properly, evaluate and analyze data critically, and make synthetic and creative interpretation of the data	P7U_U	P7S_UW
K_U03	The graduate is able to select properly and use adequate methods and tools to fulfill complex tasks and to develop new methods and tools or modify available methodologies	P7U_U	P7S_UW
K_U04	The graduate is able to present the results of his/her research, interpretation of phenomena and processes, and information acquired from scientific resources in a written and oral form using advanced information and communication techniques	P7U_U	P7S_UW
K_U05	The graduate is able to formulate and test hypotheses associated with simple research problems in biotechnology	P7U_U	P7S_UW
K_U06	The graduate is able to design and conduct experiments and measurements with the use of advanced research tools, interpret research results, and draw conclusions based on relevant scientific literature	P7U_U	P7S_UW
K_U07	The graduate is able to communicate with diverse audiences on specialized topics in the field of biotechnology, properly justify his/her opinions and standpoints, and lead a debate on a given issue	P7U_U	P7S_UK
K_U08	The graduate is able to use a foreign language at the B2 level of the Common European Framework of Reference for Languages and specialist biotechnological terminology	P7U_U	P7S_UK
K_U09	The graduate is able to work individually, cooperate with other researchers as part of team work, take the leading role in teams, and manage the work of the team on the design and implementation of various tasks in the field of biotechnology	P7U_U	P7S_UO
K_U10	The graduate is able to make independent decisions about the design and implementation of research, having in mind his/her future occupational/scientific career, and guide others in this regard	P7U_U	P7S_UU
	SOCIAL COMPETENCE: THE GRADUATE IS READY TO	**Descriptor code**	**Descriptor code**
K_K01	The graduate is ready to design and develop patterns of proper conduct in the work and life environment, take the initiative, and critically assess himself/herself as well as teams and organizations to which he/she belongs	P7U_K	P7S_KK
K_K02	The graduate is ready to be the head of a team and take responsibility for the team and the decisions made	P7U_K	P7S_KK
K_K03	The graduate is ready to assess his/her knowledge and acquired information critically, recognize the importance of biotechnological knowledge in solving theoretical and practical problems, and seek expert opinions in the case of difficulties in solving problems independently	P7U_K	P7S_KK
K_K04	The graduate is ready to fulfill social obligations, such as sharing biotechnological knowledge with others as well as initiating and co-organizing activities for the benefit of the social milieu	P7U_K	P7S_KO
K_K05	The graduate is able to initiate actions for the benefit of public interest as well as think and act in a resourceful manner	P7U_K	P7S_KO
K_K06	The graduate is ready to develop the achievements and uphold the ethos of the biotechnologist profession, comply with and develop principles of professional ethics, and support compliance with these principles taking into account changing societal needs	P7U_K	P7S_KR