Appendix No 1 to Resolution No 33 of the NCU Senate of 22 June 2021

S t u d y p r o g r a m m e

Part A) of the study programme *

L e a r n i n g o u t c o m e s

Faculty offering the field of study:	**Faculty of Biological and Veterinary Sciences**
Field of study:	**Global Change Biology**
Level of study:	**second-cycle studies**
Level of the Polish Qualifications Framework:	**level 7**
Degree profile:	**general academic**
Professional degree awarded to the graduate:	**magister**
Allocation of the field of study within academic or artistic discipline(s), to which learning outcomes for a given field of study refer:	**Discipline: Biological Sciences (100%)** **Major discipline: Biological Sciences**

Symbol	**Upon completion the graduate achieves the learning outcomes specified below:**
	KNOWLEDGE
K_W01	The graduate provides in-depth and up-to-date knowledge of biophysics and biochemistry.
K_W02	The graduate explains the biological concepts and relationships between natural phenomena and processes and connections between structure and function.
K_W03	The graduate outlines the appropriate physicochemical methods of organisms and biological processes.
K_W04	The graduate provides an understanding of the complex phenomena involving organisms and their communities.
K_W05	The graduate characterises the unity and diversity of the structure and functioning of organisms.
K_W06	The graduate supplies an understanding of the impact of organisms on their environment.
K_W07	The graduate provides in-depth knowledge of the impact of the environment on human health.
K_W08	The graduate supplies an in-depth knowledge of statistics and specialises in IT tools appropriate for describing and forecasting the course of natural phenomena.
K_W09	The graduate knows and understands the methodologies required for qualitative and quantitative investigation of the biological sciences.
K_W10	The graduate develops a knowledge of the molecular biology of biological production.
K_W11	The graduate supplies up-to-date knowledge of biological research (biochemistry, genetics, microbiology and physiology).
K_W12	The graduate is familiar with specialised computer software packages (word processors, databases, spreadsheets, numerical libraries).
K_W13	The graduate supplies an understanding of the basic concept and principles of copyright and patent law.
K_W14	The graduate supplies an understanding of the rules of ethics.
K_W15	The graduate outlines current problems in the field of biology.
K_W16	The graduate provides a thorough knowledge of the professional literature in the field, including areas of specialisation.
K_W17	The graduate defines the basic principles of occupational health and safety and ergonomics.
K_W18	The graduate sets out the principles for creating and developing individual entrepreneurship based on biological knowledge.
	SKILLS

K_U01	The graduate is a capable thorough knowledge of the use of statistics for describing biological phenomena.
K_U02	The graduate can use biochemistry, microbiology, molecular biology, and physiology to analyse natural processes.
K_U03	The graduate can use facility with advanced measurement and analytical techniques used in biological research.
K_U04	The graduate is capable of using computer literacy necessary to retrieve information, communicate, organise and analyse data, prepare reports and present results.
K_U05	The graduate can correctly assess threats to human health and life.
K_U06	The graduate is familiar with qualitative and quantitative methods for assessing the state of a population of plant and animal species and biological material.
K_U07	The graduate can develop scientific hypotheses based on logical reasoning.
K_U08	The graduate based on measurements interprets observations: production of results upon which to arrive at conclusions.
K_U09	The graduate, using English source information, can perform analyses, summaries and critically assess data, allowing formulation of correct conclusions.
K_U10	The graduate can make observations and take measurements in the field or laboratory in the presence of a tutor.
K_U11	The graduate demonstrates an ability to read and understand professional literature in the mother tongue and English.
K_U12	The graduate use of a foreign language enabling essential communication in the field of biological sciences following the requirements of B2 + CEFR.
K_U13	The graduate applies the rules of ethics when working as a leader or part of a team.
K_U14	The graduate can present the results orally in English, as well as in the writing of scientific reports.
K_U15	The graduate uses scientific language to a standard that enables the documentation and development of research results.
K_U16	The graduate demonstrates an ability to choose a specialisation and plan a professional career.
SOCIAL COMPETENCES	
K_K01	The graduate is willing to understand the need to expand knowledge using scientific and popular science magazines constantly.
K_K02	The graduate is willing to keep abreast of professional developments in natural sciences and inspire and organise the learning processes in others.
K_K03	The graduate is willing to develop a rational and critical approach to information obtained from scientific literature, the internet, and other mass media and popular beliefs relating to biological sciences.
K_K04	The graduate is willing to remain aware of the responsibility for the reliability of analyses and expert opinions.
K_K05	The graduate is willing to be aware of the need to follow the rules of ethics.
K_K06	The graduate is willing to keep a critical eye on working results.
K_K07	The graduate is willing to be eager to popularise biological knowledge.
K_K08	The graduate is willing to remain aware of the need to use mathematical, statistical and IT methods to develop and present the results and analyses.
K_K09	The graduate is willing to be responsible for the safety of your own and others' work, with appropriate risk assessment and awareness of the necessity for creating safe working conditions.
K_K10	The graduate is willing to be responsible for the equipment used during research.
K_K11	The graduate is willing to capable of teamwork.
K_K12	The graduate is willing to be aware of the importance of taking the initiative.

Part *B) of the study programme*

Description of the process resulting in the achievement of learning outcomes

Faculty offering the field of study:	Faculty of Biological and Veterinary Sciences
Field of study:	Global change biology
Level of study:	Second cycle
Level of the Polish Qualifications Framework:	Level 7
Degree profile:	General academic
Allocation of the field of study within academic or artistic discipline(s), to which learning outcomes for a given field of study refer:	Discipline: biological sciences (100 %) **Major discipline**: Biological Sciences
Mode of study:	Full-time programme
Number of semesters:	4
Number of ECTS required for the award of qualifications corresponding to the level:	120
Total number of teaching hours:	1100 + hours of university – wide courses
Professional degree awarded to the graduate:	Magister
The relationship between the study programme and NCU mission and strategy:	The program of the Global Change Biology is in line with the main strategic goal of the Nicolaus Copernicus University, which is consolidating the position among the best focal points and teaching. The created course of study also has two operational goals - education of the educated strategic level: a) redistribution of studies from abroad and thus an appropriate level of the number of courses / development courses in foreign languages; b) courses of study offer in foreign languages. The program is structured to provide plug-in protection in education. Its aim is not only to transfer the latest knowledge, but also skills and development skills

Courses/course modules along with expected learning outcomes *

Course module	Course	Expected learning outcomes	Forms and methods of teaching ensuring the achievement of learning outcomes ….	Methods of verifying and assessing expected learning outcomes achieved by the student
Ecology and Evolution	Animal and Plant Ecophysiology	W1- Student has basic knowledge on biological	Expository teaching methods: - Laboratory: illustrative	Laboratory – project in groups 61-68% satisfactory, 69-76% satisfactory plus, 77-84 % good,

		concepts and complex natural phenomena and processes, as well as relationships and dependencies between structure and function.-K_W01, K_W02, K_W09 W2- Student understands which underlying factors determine rates of plant and animals growth and development.- K_W06 W3- Student is familiar with the physiological, morphological- and anatomical characteristics of plants and animals adapted to various habitats. - K_W03, K_W15 W4- Student is familiar with the phenomena occurring in organisms and their communities, the interactions of the environment and organisms living in it. K_W04, K_W11 W5- Student understands the impact of stress on plant growth and development and on crop production.-K_W16 W6- Student has knowledge on the current and future impact of global change and understands how this may affect plants and animals and the environments in which they live.- K_W04, K_W06 W5- student follows the safety and ergonomics rules - K_W17	and research based on written instructions; students carry out tasks individually or in pairs; classes are conducted in a group of 8-12 students, because it is required by methodology of experiments: access to laboratory equipment and devices, and work with chemical reagents.	85- 92% good plus, 93-100% very good W1, W2, U1, U2, K1

		U1- Student is familiar with a range of experimental approaches used to investigate the impact of changes in environment on the growth and physiology of plants and animals.- K_U08 U2 - Student is able to use knowledge of physiology, biochemistry and molecular biology in the analysis of natural processes.-K_U02 U3- Student has basic skills in advanced measurement and analytical techniques used in biological research.- K_U03 U4- Student can analyse measurements, interpret observations, and on their basis, develop and describe the results and draw correct conclusions.- K_U10 U5- Student can critically analyse and discuss scientific literature in the field of plant and animals physiological ecology. K_U11 K1- Student understands the need to constantly expand knowledge with the use of scientific and popular science magazines. K-K07 K2- Student is aware of the responsibility for the reliability of analyses and expert opinions.		

		- K_K01 K3- Student is responsible for the safety of his own and others' work, risk assessment and creating safe working conditions. - K_K09		
	Biostatistics	W1: defines a task or problem in the field of his specialty and selects appropriate statistical methods to solve them K_W08, K_W09 U1: applies advanced knowledge in the field of statistics to the biological data K_U01 U2: is able to use a foreign language to communicate at a basic level in accordance with the requirements of B2 ESOKJ K_U12 U3: has the ability to present results in English, as well as write a report in English K_U14 K1: demonstrates the ability to use statistical and multivariate methods to develop and present results and analyses K_K08 K2: can work in a team, both by directing and coordinating the team's activities and by performing assigned tasks K_K11	Expository teaching methods: discussion, presentation, video / computer, pointer, banners image	Laboratory – project in groups 61-68% satisfactory, 69-76% satisfactory plus, 77-84 % good, 85- 92% good plus, 93-100% very good W1, W2, U1, U2, K1
	Multivariate analysis	W1: defines a task or problem in the field of his specialty and selects appropriate statistical methods to solve them K_W08,	Expository teaching methods: discussion, presentation, video / computer, pointer,	Laboratory – project in groups 61-68% satisfactory, 69-76% satisfactory plus, 77-84 % good, 85- 92% good plus, 93-100% very

		K_W09 U1: applies advanced knowledge in the field of statistics to the biological data K_U01 U2: is able to use a foreign language to communicate at a basic level in accordance with the requirements of B2 ESOKJ K_U12 U3: has the ability to present results in English, as well as write a report in English K_U14 K1: demonstrates the ability to use statistical and multivariate methods to develop and present results and analyses K_K08 K2: can work in a team, both by directing and coordinating the team's activities and by performing assigned tasks K_K11	banners image	good W1, W2, U1, U2, K1
	Ecology of Populations and Communities	W1: explains the interactions between organisms and environment- K_W06 W2 – describes and explains mechanisms of biological invasions – K_W04 W3 – describes the impact of biological invasions on the environment, economy and human health – K_W06, K_W07 W4 – knows the recent literature on biological invasions – K_W16 W5: defines the phenomenon of	Standard lecture, demonstration, preparing and conducting experiments, work with literature data	Lecture: Written exam – a test consisting of open and closed questions. Criteria for the final grade: 50-60% points - 3, 61-70% - 3+, 71-80% - 4, 81-90% - 4+, >90% - 5 Laboratory: Written tests during laboratory classes Test of skills in identification of alien organisms Evaluation of a report prepared on the basis of the conducted experiment Evaluation of a short presentation

		parasitism and explains parasitological terms - K_W02 W6: explains the interactions between parasites and environment - K_W07 U1 – designs, conducts and interprets simple experiments under the teacher's supervision – K_U08, K_U09, K_U10 U2 – reads scientific literature in the field of biological invasions – K_U11 U3 – presents the results of conducted experiments and literature surveys – K_U14 U4: Correctly evaluates parasitic threats to human health and life - K_U05, K_U06 U5: Has oral presentation skills in English - K_U14, K_U12 K1 – is critical with regard to the results of own work and data on biological invasions from scientific and popular sources – K_K03, K_K06 K2 – is capable of team work during conducting experiments and preparing reports – K_K07, K_K11 K3: is responsible for work safety in a parasitological laboratory - K_K09 K4: shows criticism in relation to the results of his work - K_K07		in the field of biological invasions (mechanisms, important species, recent findings) on the basis of scientific literature provided by teachers Activity during the classes Final grade in laboratory classes will be an average of grades received in the above-mentioned categories
	Genetics and Evolution	Student W1: explains biological	Expository teaching methods:	Assessment methods: Laboratory – presentation in

		concepts and complex of natural phenomena and processes K_W02 W2: has knowledge in the field of molecular biology in the environment K_W01, K_W10 W3 - describes and explains factors affecting organisms spatial distribution - K_W02, K_W06 W4 – knows molecular markers and describes molecular methods used in biogeography - K_W10, K_W11 W5 – knows the recent literature on molecular biogeography – K_W16 Student U1: is able to use source information in English, performs analysis, synthesis, summarises and makes a critical assessment, which allows correct inference K_U09 U2: is able to use a foreign language to communicate at a basic level in accordance with the requirements of B2 ESOKJ K_U12 U3: has the ability to present results in English, as well as write a report in English K_U14 Student K1: understands the need to improve the knowledge with the use of scientific and popular journals K_K01	discussion, presentation, video / computer, pointer, banners image	groups, 61-68% satisfactory, 69-76% satisfactory plus, 77-84 % good, 85- 92% good plus, 93-100% very good W1, W2, U1, U2, U3, K1, K2

		K2: rationally and critically approaches information obtained from scientific literature, the internet, and other sources of mass media, as well as common beliefs relating to the topic K_K03		
	Dynamic biogeography	W1 – describes and explains mechanisms of plant geography – K_W04 W2 – describes the impact of plant and animal geography on the environment, economy and human health – K_W06, K_W07 W3 – knows the recent literature on biogeography – K_W16 W4 – knows the principles of phytogeography and zoogeography – K_W05 W5 – knows the importance of distribution of animals for the function of ecosystems, human economy and health – K_W06 W6: Student explains the interactions between organisms and their environment (K_W07) U1 – designs, conducts and interprets simple experiments under the teacher's supervision –K_U04, K_U08, K_U10 U2 – reads scientific literature in the field of biogeography – K_U11 U3 – presents the results of conducted experiments and	Standard lecture, demonstration, preparing and conducting experiments, work with literature data	Lecture: Written exam – a test consisting of open and closed questions. Criteria for the final grade: 50-60% points - 3, 61-70% - 3+, 71-80% - 4, 81-90% - 4+, >90% - 5 Laboratory: Written tests during laboratory classes Test of skills in identification of plant species Evaluation of a report prepared on the basis of the conducted experiment Evaluation of a short presentation in the field of plant geography (mechanisms, important species, recent findings) on the basis of scientific literature provided by teachers Activity during the classes Final grade in laboratory classes will be an average of grades received in the above-mentioned categories

		literature surveys –K_U09, K_U14 K1 – is critical with regard to the results of own work and data on plant and animal geography from scientific and popular sources – K_K01, K_K03, K_K04 K2 – is capable of team work during conducting experiments and preparing reports – K_K06, K_K11		
	Applied Ecophysiology	W1: has knowledge of animal and physiological ecology- K_W03 W2: knows relationships between animals, plants and environment- K_W02, K_W06 W3: explains biological terms and relations between ecology and physiology- K_W15 W4: identifies basic analytical methods used in physicochemical studies of organisms- K_W01, K_W11 W5- student follows the safety and ergonomics rules - K_W17 W6- Student can define a risk assessment during the fieldwork-K_W17 U1: applies basic natural-sciences knowledge to describe	Standard lecture, demonstration, preparing and conducting experiments, work with literature data	Assessment methods: - test Assessment criteria: fail- 0-59 %) satisfactory- 60-70%) satisfactory plus- 71-80% good – 81-87% good plus- 88-94% very good- >94%)

		biological phenomena- K_U02 U2: uses basic tools and techniques used in biology- K_U03 U3: correctly formulates research hypotheses- K_U07 U4: uses sourses of scientific information- K_U09 K1: understands the need for continuous broadening of their knowledge- K_K01 K2: reasonably and critically deals with information obtained from the scientific literature, internet and other mass media, as well as from the common knowledge concerning biological sciences- K_K06, K_K03 K3: is aware of the need to adhere to ethical standards- K_K05		
Bioconservation	Ecosystem Functioning	W1: Explains biological concepts and complex natural phenomena and processes, as well as relationships and dependencies between structure and function - K_W02 W2: Explains the interaction of the environment and organisms living in it - K_W07 U1: Performs measurements, interprets observations, and on their basis, develops and describes the results and draws correct conclusions. -K_U08	1. lecture with multimedia presentation 2. laboratory work	Lecture – W01, W02, U01 - a test consisting of open and closed questions. Criteria for the final grade: 50-60% points - 3, 61-70% - 3+, 71-80% - 4, 81-90% - 4+, >90% - 5 Laboratory classes –U02 - project in groups and test consisting of open and closed questions. Criteria for the final grade: 61-68% satisfactory, 69-76% satisfactory plus, 77-84 % good, 85- 92% good plus, 93-100% very good.

		U2: Designs and carries out observations and measurements in the field and / or laboratory in the presence of a tutor - K_U10 U3: Uses a foreign language enabling communication at a basic level in the field of biological sciences in accordance with the requirements of B2 + CEFR - K_U12 K1: Understands the need to increase professional competences in the field of natural sciences and is able to inspire and organise the learning process of other people - K_K02 K2: Has a rational and critical approach to information obtained from scientific literature, the internet, and other mass media, as well as popular beliefs relating to biological sciences. - K_K03 K3: Is responsible for entrusted equipment, own work and others. - K_K10 K4: Is capable of teamwork. - K_K11		
	Advanced techniques in environmental data analysis	W1: defines a task or problem in the field of his specialty and selects appropriate statistical methods to solve them K_W08, K_W09 W2: Has basic knowledge of the nature of climate changes in the Earth's history, with particular	Lecture and problem-based lesson with multimedia presentations Laboratory exercises: experiments, climatological analyses based on collections of meteorological data, maps	1. Written examination in the form of test. Mark range: Percent of correct answers: Mark 0-50% fail (2,0) 51-60% pass (3,0) 61-70% pass plus (3,5)

		focus on the last thousand years – K_W02 W3: Knows the potential factors (both natural and anthropogenic) determining present and future climate and climate changes – K_W02 W4: Is able to assess the direction and rate of climate variations on various time and spatial scales – K_W02, K_W06, K_W07 W5: Has the essential knowledge to assess the probable consequences of climate changes on the natural environment and the economy – K_W02, K_W06, K_W07 U1: applies advanced knowledge in the field of statistics to the biological data K_U01 U2: is able to use a foreign language to communicate at a basic level in accordance with the requirements of B2 ESOKJ K_U12 U3: has the ability to present results in English, as well as write a report in English K_U14 U4: Is able to use and expand their knowledge in order to apply it to analysis of environmental processes – K_U04, K_U05, K_U07, K_U08 U5: Is able to practically define	and atlases.	71-80% good (4,0) 81-90% good plus (4,5) 91-100% very good (5,0) 2. Laboratory classes: marks from classes in the form of reports, marks given based on activity of students during classes; final mark is calculated as mean from all marks in the following way: 2,51-3,39 – pass, 3,40-3,74 – pass plus, 3,75-4,19 – good, 4,20-4,50 – good plus, above 4,50 – very good

		the interdependencies between climate changes and the natural environment – K_U04, K_U09, U6: Is able to seek out, comprehend, analyse and exploit required information from the basic sources related to climate changes and its causes – K_U09, K_U11, K_U15 U7: Uses knowledge acquired relating to climate change and its causes in analyses of its influence on the natural environment and man – K_U09, K_U11, K_U15 K1: demonstrates the ability to use statistical and multivariate methods to develop and present results and analyses K_K08 K2: can work in a team, both by directing and co-ordinating the team's activities and by performing assigned tasks K_K11 K1: Understands the need to maintain up-to-date knowledge on climate change and its causes – K_K01, K_K02, K_K03 K3: Is able independently or as part of a team to reliably and fairly assess the consequences of climate changes on the natural environment and man, and provide rational solutions – K_K02, K_K03, K_K04, K_K05 K4: Is able to appropriately		

		define priorities in the realisation of tasks set by self or others – K_K01, K_K04, K_K05, K_K08, K_K11		
	Environmental impacts of genetically modified organisms	W1: Student uses the specific terminology and defines: transgenic organisms, GMM, GMO, LMO, promoter, exon, intron, terminator, mutant, cloning, genetic engineering - K_W02 K_W10, K_W11 W2: Student lists the stages of creating transgenic plants and plant selection genes - K_W02, K_W10, K_W11 W3: Student combines the structure of a genetic construct introduced into plants with its functionality - K_W02, K_W04 W4: Student has knowledge in the field of selection and targeted modification of plants in order to obtain new features useful for humans and the environment K_W10, K_W11, W5: Student indicates the benefits and risks of using biotechnology in relation to man and the environment K_W06, K_W07, W6: Student independently assesses the threats to health and human life currently discussed in specialist literature regarding GMM or GMO - K_W06, K_W07, K_W16, U1: Student uses specialist	Lecture: informative lecture with multimedia presentations	Lecture: Test written exam consisting of single-choice questions offering 4 eventualities. Each correct answer - 1 points. At least 20 questions in the test. Passing the exam after reaching at least 50% of the points available. Very good mark for more than 90% of the points. Other grades proportionally in the 50-90% range. Written exam - W01, W02, W03, W04, W05, U01, U02, U03

		terminology and biological nomenclature and specialised terms in genetics, biochemistry, biotechnology K_U02 U2: Student plans, illustrates and modifies the structure of the introduced construct to the GM plant - K_U02 U3: The student correctly evaluates threats to human health and life about GMM and GMO - K_U05 K1: Student follows the rules of ethics - K_K05 K2: Student rationally and critically approaches information obtained from scientific literature, the internet, and other sources of mass communication regarding GMM or GMO - K_K02, K_K03 K3: The student is eager to popularise biological knowledge about GMM and GMO K_K07		
	Applied ecosystem services	W1: Students can analyse natural resource and environmental management problems by using appropriate methods from natural science disciplines K_W02 W2: Students demonstrate knowledge of ecological principles, and interdisciplinary aspects of natural resource and environmental management issues K_W02, W3: Students are able to	Laboratory: group work - students carry out projects in groups of 2-3 persons and presentation, discussion and case study analysis, two essays Lecture: informative lecture, discussion	Assessment methods: - written project with oral presentation - written examination - test - activity Assessment criteria for lecture: - activity, - the presence of the lecture - written exam Assessment criteria for tutorial: - activity, - the presence of the tutorial

		characterise the organisation and functioning of ecological systems and the relationship between the organism and the environment K_W05 W5: objaśnia rolę i znaczenie środowiska przyrodniczego dla funkcjonowania człowieka; K_W13 W6: Students describes changes and environmental hazards caused by human activity on the surface of the earth, in soils and waters; K_W07 W7: Students lists and describes the basic methods, technologies, tools that allow to use the natural potential to improve the quality of human life, as well as allow for the restoration of lost natural values; (K_W08) U1: Students communicate effectively, both orally and in writing, to diverse audiences including professionals, resource managers, local communities and policy makers; (K_U14, K_U15) U2: Students can conduct original, independent scientific research of professional quality in their specialisation area; (K_U16) U3: Students can function as professionals in their specialisation area by demonstrating responsible and		- positive test passed - positive written project passed - well received presentation of the project - two essays Assessment a percentage for test: fail - below 55% satisfactory - 56-64 % satisfactory plus - 65-74 % good – 75-84 % good plus - 85-94 % very good - 95-100 %

		ethical conduct, effective collaboration, informed decision making, and life-long learning; K_U13, K_U16) U4: Students uses a computer to search for information, create databases, analyse data, prepare reports and present results; (K_U04) U4: Students recognise the health and environmental hazards and put the correct hypotheses about their causes; (K_U05, K_U07) U5: Students interpret observations and measurements and draw correct conclusions on their basis; (K_U09) U7: Students use source information in English, carry out analyses, syntheses, summaries, critical assessments and correct conclusions; (K_U09) K1: Students can function as professionals in their specialisation area by demonstrating responsible and ethical conduct, effective collaboration, informed decision making, and life-long learning; (K_K01, K_K02) K2: Students can constructively critique real or possible programs, policies, and institutions that impact ES, based on those possible impacts and the concepts of efficiency,		

		equity, and sustainability; (K_K01; K_K03, K_K05) K3: Students can advocate and support their views on the pros and cons of economic valuation of ecosystem services and other routes to affecting decision-making based on ecosystem services research and stakeholder input; (K_K01; K_K03, K_K07) K4: Students are willing to work in a team as a member; (K_K11)		
	The future of land use	W1: Students can analyse natural resource and environmental management problems by using appropriate methods from natural science disciplines K_W02 W2: Students demonstrate knowledge of land use planning objectives and interdisciplinary aspects of natural resource and environmental management issues K_W02, W3: Students are able to characterise the organisation and functioning of ecological systems and the relationship between the organism and the environment (K_W05) W4: Students lists and describes the basic methods, technologies, tools that allow to use the natural potential to improve the quality of human life (K_W08) U1: Students communicate	Laboratory: group work - students carry out projects in groups of 2-3 persons and presentation, discussion and case study analysis, two essays Lecture: informative lecture, discussion	Assessment methods: - written project with oral presentation - written examination - test - activity Assessment criteria for lecture: - activity, - the presence of the lecture - written exam Assessment criteria for tutorial: - activity, - the presence of the tutorial - positive test passed - positive written project passed - well received presentation of the project - two essays Assessment a percentage for test: fail - below 55% satisfactory - 56-64 % satisfactory plus - 65-74 % good – 75-84 % good plus - 85-94 %

		effectively, both orally and in writing, to diverse audiences including professionals, resource managers, local communities and policy makers; (K_U14, K_U15) U2: Students can conduct original, independent scientific research of professional quality in their specialisation area; (K_U16) U3: Students can function as professionals in their specialisation area by demonstrating responsible and ethical conduct, effective collaboration, informed decision making, and life-long learning; K_U13, K_U16) U4: Students uses a computer to search for information, create databases, analyse data, prepare reports and present results; (K_U04) U5: Students interpret observations and measurements and draw correct conclusions on their basis; (K_U09) U6: Students use source information in English, carry out analyses, syntheses, summaries, critical assessments and correct conclusions; (K_U09) K1: : In the concept of the spatial development plan students can refer the examples of foreign solutions described in		very good - 95-100 %

		the scientific literature of Elsevier journals and reports on the implementation of the projects available on the web (K_K01, K_K02, K_K03) K2: Students can constructively critique and discuss real or possible programs, policies and the concept of the project, arguing for and against; (K_K01; K_K03) K3: Students can advocate and support their views on the pros and cons of economic valuation of ecosystem services and other routes to affecting decision-making based on ecosystem services research and stakeholder input; (K_K01; K_K03, K_K04, K_K07) K4: Students are aware of the work in a group, taking a leadership role and responsibility for the implementation new tasks; (K_K11, K_K12)		
	The last of the wild: European protected areas	W1 – knows the distribution of important habitats across Europe – K_W02 W2 – knows the principles of creation national parks and nature reserves – K_W15 W3 – knows the reasons for the threat of nature – K_W02, K_W14 W4 – knows the principles of nature conservation – K_W05	Information lecture, problem lecture Team projects in laboratory classes based on field and literature data	Lecture Written exam – a form consisting of descriptive and problematic questions covering the whole scope of knowledge delivered on lectures and obtained during self-study. Criteria for the final grade (points related to % of correct answers): 51-60% - 3 points, 61-70% - 3+ points, 71-80% - 4 points, 81-90%

		U1 – knows how to define the value of habitat – K_U06 U2 – knows how to fill out the Natura 2000 standard data forms – K_U08, K_U13 U3 – knows how to use and interpret various literature and data base sources – K_U11 K1 – is capable of team work during gathering data and preparing reports – K_K04 K2 – is capable to estimate negative impact of human activity on the environment and suggest the proper methods of counteraction – K_K05 K3 – is capable to present the ideas of nature conservation for a wider audience – K_K07		- 4+ points, >90% - 5 points Laboratory classes Written test – descriptive and multiple-choice test checking the knowledge obtained during laboratory classes. Presentation of results of team-project activity Multimedial presentation of one of topics based on recent literature Overall activity during classes The final grade will be based on all listed activities (from 3 to 5)
	Applied statistics and spatial analysis in GIS	W1: Demonstrates an increased knowledge in the field of numeric maps analysis and geospatial data statistics as well as knowledge of specialised IT tools that enable describing and forecasting the course of natural phenomena – K_W08, K_W12 U1: Applies an advanced knowledge in the field of GIS analysis and statistics in the analysis of biological data of spatial nature – K_U01 U2: Makes use of a computer to find information, arrange data, develop reports and presentations of results obtained based on the numeric maps	Seeker teaching methods: practical classes; project method.	Assessment methods: - test Assessment criteria: number of points obtained on final test fail- 0-55 pts (0-55 %) satisfactory- 55-64 pts (55-64%) satisfactory plus- 65-74 pts (65-74%) good - 75-84 pts (75-84%) good plus- 85-94 pts (85-94%) very good- 95-100 pts (95-100%)

		analysis – K_U04 U3: Puts correct scientific hypotheses based on logical reasoning – K_U07 K1: Demonstrates the ability to use mathematical, statistical and IT methods for the development and presentation of results and analyses – K_K08 K2: Is responsible for the entrusted equipment, own work and activities of others – K_K10		
	Case studies in global change	W1 – describes and explains environmental effects of global changes – K_W04, K_W06 W2 – knows the recent literature on selected biological topics – K_W16 U2 – reads scientific literature concerning global changes in the environment – K_U11 U3 – presents the results of conducted literature surveys – K_U14 K1 – is critical with regard to the results of own work and data on global change in the environment from scientific and popular sources – K_K03, K_K06	Discussion, literature surveys, student presentations	Evaluation of a presentation on the selected topic Activity during the classes (participation in discussion after presentations) Final grade in laboratory classes will be an average of grades received in the above-mentioned categories
Social and legal affairs	European legal regulations in environmental protection	W1: Has in-depth knowledge of the influence of the environment on human health - K_W07 W2: Demonstrates knowledge of current problems in the field of biology - K_W15	LECTURE: a) teaching methods specifying: - informative lecture (conventional) - problem lecture b) didactic methods looking	LECTURE Assessment criteria (written test) - W1, W2 EXERCISES Colloquium - W1, W2, U1, U2 Paper - W1, W2, U1, U2 Activity - K1, K2 LECTURE Written exam: written test consisting of 25 questions (closed

		U1: Puts correct scientific hypotheses based on logical reasoning - K_U07 U2: Uses source information in English, performs analysis, synthesis, summarises and makes a critical assessment, which enables correct conclusions - K_U09 K1: Understands the need to constantly expand knowledge with the use of scientific and popular science magazines - K_K01 K2: Has a rational and critical approach to information obtained from scientific literature, the internet and other mass media sources, as well as to popular beliefs relating to biological sciences - K_K03	for: - classic problem method EXERCISES: Didactic searching methods: - classic problem method - a paper - case study	questions - single choice; 1 question - 1 point): nst - 12 points (48%) dst - 13-18 pts (52-72%) dst plus - 19 points (76%) db - 20-21 (80-84%) db plus - 22 points (88%) very good - 23-25 points (93-100%) EXERCISES Colloquium: written test consisting of 15 questions (closed-single-choice questions; 1 question - 1 point): nst - 7 points (46%) dst - 8-9 pts (53-60%) dst plus - 10 points (66%) db - 11-12 (73-80%) db plus - 13 points (86%) very good - 14-15 points (93-100%) Paper - standard grading scale (evaluation criterion - way of completing the topic) Activity - Three pluses equal to 0.5 ratings on the regular rating scale
	Socioeconomic aspects of global change	W1: discuss possible ways of ensuring sustainable futures in the face of global environmental change (K_W16) W2: explore emerging environmental governance issues and legislative frameworks (K_W13) W3: introduce concepts and terms used in socio-economic analysis of environmental issues as well as methods of data collection, analysis and use of information (K_W15) Students should be able to: W4: understand the economic,	Expository teaching methods: informative lecture, discussion, presentation, video / computer, pointer, banners image	Assessment methods: Lecture – final test, 61-68% satisfactory, 69-76% satisfactory plus, 77-84 % good, 85- 92% good plus, 93-100% very good W1, W2, U1, U2, U3, K1, K2 Laboratory – project in groups, 61-68% satisfactory, 69-76% satisfactory plus, 77-84 % good, 85- 92% good plus, 93-100% very good W1, W2, U1, U2, U3, K1, K2

		socio-cultural, and political incentives and impediments to rainforest conservation; (K_W02) W5: students understand the interactions between human and ecological systems; (K_W04) W6: students appreciate the dilemmas in choosing between economic development and the environment;(K_W02, K_W04, K_W05) W7: students describe changes and environmental hazards caused by human activity on the surface of the earth, in soils and waters;(K_W07) W8: students know professional foreign language literature in the field of selected specialisation (K_W16) W9: students know the rules of ethics; (K_W14) W10: explains biological concepts and complex of natural phenomena and processes under global urbanisation K_W02 W11: demonstrates knowledge of current issues in the field of global change and natural resources K_W15 U1: better understand the array of socio-cultural, economic and political factors that shape resource use; (K_U14, K_U15) U2: conduct original, independent scientific research		

		of professional quality in their specialisation area; (K_U16) U3: use source information in English, carry out analyses, syntheses, summaries, critical assessments and correct conclusions; (K_U09) U4: recognise the health and environmental hazards and put the correct hypotheses about their causes; (K_U05, K_U07) U5: demonstrate the information literacy skills of collecting, analysing and reporting data; (K_U09) U6: is able to use source information in English, performs analysis, synthesis, summarises and makes a critical assessment, which allows correct inference K_U09 U7: is able to use a foreign language to communicate at a basic level in accordance with the requirements of B2 ESOKJ K_U12 U8: has the ability to present results in English, as well as write a report in English K_U14 K1: Students demonstrate the desire to deepen knowledge in the field of socio-economic sciences; (K_K01) K2: Students show caution and criticism in receiving information from the scientific literature, the internet, and		

		especially accessible in mass media, referring to social issues (K_K03) K3: Students can cooperate with a good communication and work with other students; (K_K11) K4: Students are willing to work in a team as a member; (K_K11) K5: Students show criticism in relation to the results of his work; (K_K06) K6: understands the need to improve the knowledge with the use of scientific and popular journals K_K01 K7: rationally and critically approaches information obtained from scientific literature, the internet, and other sources of mass media, as well as common beliefs relating to the topic K_K03		
Elective course module, e.g., university-wide courses or courses included in another field of study that are unrelated to a specific field of study and Diploma project ***	Thesis Lab	W1: has knowledge of how to prepare presentations, reports, studies and manuscripts and mathematical knowledge in the field of data processing and analysis K_W08, K_W12, W2: has in-depth knowledge in main disciplines enabling research and practical activities in the field of biology K_W01, K_W02, K_W03, K_W04, K_W05, K_W06, K_W07, K_W11, K_W15, W3: identifies sources of scientific information on current	Laboratory work: project planning, experimental phase, data analysis, literature review, discussion. Working out the theoretical background, literature search, thesis layout, data analysis, final writing.	Continuous marking according to the criteria established by the thesis promotor

		trends in the discipline development, planning experiments, analyses and interprets the obtained results K_W09, K_W11, K_W12, K_W15, W4: speaks English to the extent necessary to read the current specialist literature in the field of study K_W15, K_W16 W5: characterises the research methodology of the practiced discipline and detailed research techniques of the practiced specialisation - K_W03, K_W13, K_W14 W6- student knows the safety and ergonomics rules - K_W17 W7- Student defines a risk assessment during the fieldwork-K_W17 W8- Student knows the possibilities of applying the acquired knowledge in the professional practice K_W18 U1: can prepare and present lectures, reports, documentation of experiments/analyses, and expert opinions using correct scientific and technical terminology. K_U01, K_U04, K_U07, K_U08 U2: uses knowledge from field disciplines enabling research and practical activities in the field of biology K_U01, K_U02,		

		K_U03, K_U06, K_U07, U3: acquires, interprets and critically evaluates information from scientific sources relating to the discipline studied K_U04, K_U09, K_U11, U4: speaks English on B2 ESOKJ level K_U12, K_U14, U5: uses knowledge from various fields of science when planning research in biology - K_U01, U6: writes scientific articles in English - K_U12, K_U15, K_U16 K1: is aware the importance of the ethics principle in the activity of molecular diagnostics, both in scientific and professional work K_K05, K_K04, K2: is aware the limitations, but also the ever-widening knowledge and development of technology; understands the need for lifelong learning K_K01, K_K02, K3: is aware the social problems and dangers associated with the development of molecular biology, in particular the development and use of genetically modified organisms; can explain the true meaning of these threats based on rational arguments but in a way that is understandable to the general		

		public K_K03, K_K04, K_K05, K4: critically analyses the results of own research and research of other authors and is aware the need to undertake activities that increase the value of research and increase the effectiveness of work K_K03, K_K07 K5: acts in accordance with the code of ethical principles of scientific work and good manners - K_K06, K_K09 K6: respects the principles of public ownership of scientific research results, taking into account the principles of intellectual property protection - K_K07		
Diploma project and diploma examination ***	Thesis of Specialisation	W1- The graduate describes the rules of preparing and writing research papers- K_W13, K_W14, K_W16 W2- The graduate enumerates and discusses most important specialist literature in the field that is the focus of the Master's thesis-K_W15 W3- student knows the safety and ergonomics rules - K_W17 W4- Student can define a risk assessment during the fieldwork-K_W17 W8- Student knows the possibilities of applying the acquired knowledge in the professional practice K_W18		assessment of the thesis

		U1-The graduate prepares research papers in and short scientific reports following general standards of writing research papers- K_U03, K_U10, K_U15 U2- The graduate is able to use specialist terminology in the field of environment protection in English- K_U12 U3- The graduate combines information from various sources in order to verify the existing opinions and hypotheses- K_U08 K1- The graduate is able to adequately specify his/her priorities in order to accomplish a task set by himself/herself or by other persons- K_K01, K_K02, K_K06, K_K09. K_K10, K_K11, K_K12		
Physical Education	**n/a**	**n/a**	**n/a**	**n/a**
Foreign language classes	**n/a**	**n/a**	**n/a**	**n/a**
Internships**	**n/a**	**n/a**	**n/a**	**n/a**
Internships**				
Duration of internships	**n/a**			
Form of internships	**n/a**			
Rules of internships	**n/a**			
Detailed allocation of ECTS credits				
Academic or artistic disciplines, to which learning outcomes refer:				

	Academic discipline	ECTS credits	
		number	%
1.	Biological sciences	120	100%

Course modules	Course	No of ECTS credits	No of ECTS credits in the discipline: *(enter names of disciplines)*****	No of ECTS credits for elective courses	No of ECTS credits obtained by the student in classes within contact hours with the teacher or tutor	No of ECTS credits obtained by the student as a result of: courses related to academic activity within a discipline or disciplines, to which the field of study is assigned *****/ courses focused on training practical skills ******
Ecology and Evolution	Animal and Plant Ecophysiology	**5**	**5**		**2.1**	**5**
	Biostatistics	**5**	**5**		**2.1**	**5**
	Multivariate analysis	**5**	**5**		**2.1**	**5**
	Ecology of Populations and Communities	**5**	**5**		**2.1**	**5**
	Genetics and Evolution	**5**	**5**		**2.1**	**5**

	Dynamic biogeography	**9**	**9**		**4.3**	**9**
	Applied Ecophysiology	**4**	**4**		**1.8**	**4**
Bioconservation	Ecosystem Functioning	**5**	**5**		**2.1**	**5**
	Advanced techniques in environmental data analysis	**5**	**5**		**2.1**	**5**
	Environmental impacts of genetically modified organisms	**2**	**2**		**1.1**	**2**
	Applied ecosystem services	**5**	**5**		**2.1**	**5**
	The future of land use	**4**	**4**		**1.8**	**4**
	The last of the wild: European protected areas	**4**	**4**		**1.8**	**4**
	Applied statistics and spatial analysis in GIS	**3**	**3**		**1.5**	**3**
	Case studies in global change	**4**	**4**		**1.8**	**4**
Social and legal affairs	European legal regulations in environmental protection	**3**	**3**		**1.5**	
	Socioeconomic aspects of global change	**3**	**3**		**1.5**	
Diploma project ***	Thesis Lab	**14**	**14**	**14**	**9.5**	**14**
Elective course module, e.g., university-wide courses or courses included in another field of study that are unrelated to a specific field of study and Diploma project and diploma examination	Thesis of Specialisation	**30**	**30**	**30**	**16.7**	**30**

*******						
Physical Education						
Foreign language classes						
Internships**						
IN TOTAL:			**120/100%**	**44/36.7%**	**60.1/50.1%**	**114/95%**

*** the description of a course syllabus is attached to the study programme**

This study programme is effective as of winter semester of the academic year 2021/2022.