ASIIN Seal

Accreditation Report

Bachelor's Degree Programmes and Master's Degree Programmes
Biology
Biotechnology
Ecology

Provided by
Eurasian National University Astana, Kazakhstan

Version: 31st March 2017

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
бакалавр Биология	Ba Biology	ASIIN	none	10
магистр Биология	Ma Biology	ASIIN	none	10
бакалавр Биотехнология	Ba Biotechnology	ASIIN	none	10
магистр Биотехнология	Ma Biotechnology	ASIIN	none	10
бакалавр Экология	Ba Ecology	ASIIN	none	10
магистр Экология	Ma Ecology	ASIIN	none	10
Date of the contract: 05.09.2013 **Submission of the final version of the self-assessment report:** 26.01.2015 **Date of the onsite visit:** 18. – 22.05.2015 **at: Astana**				
Peer panel: Prof. Dr. Ulrich Hahn, University of Hamburg Prof. Dr. Oliver Müller, University of Applied Sciences Kaiserslautern Thomas Illies, TOO Agrotom Kazakhstan Yekaterina Astafyeva, South Kazakhstan State University				

[1] ASIIN Seal for degree programmes
[2] TC 10 – Life Sciences

Representative of the ASIIN headquarter: Rainer Arnold	
Responsible decision-making committee: Accreditation Commission for Degree Programmes	
Criteria used: European Standards and Guidelines as of 10.05.2015 ASIIN General Criteria, as of 04.12.2015 Subject-Specific Criteria of Technical Committee 10 – Life Sciences as of 09.12.2011	

In order to facilitate the legibility of this document, only masculine noun forms will be used hereinafter. Any gender-specific terms used in this document apply to both women and men.

B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Ba Biology	B.Sc.	-	6	Full time	No	8 Semester	240 ECTS 154 Kazakh Credit Points	Fall term 01.09.2011
Ma Biology	M.Sc.	-	7	Full time	No	4 Semester	120 ECTS 59 Kazakh Credit Points	Fall term 01.09.2011
Ba Biotechnology	B.Eng.	-	6	Full time	No	8 Semester	240 ECTS 154 Kazakh Credit Points	Fall term 01.09.2011
Ma Biotechnology	M.Eng.	-	7	Full time	No	4 Semester	120 ECTS 59 Kazakh Credit Points	Fall term 01.09.2011
Ba Ecology	B.Sc.	-	6	Full time	No	8 Semester	240 ECTS 154 Kazakh Credit Points	Fall term 01.09.2011
Ma Ecology	M.Sc.	-	7	Full time	No	4 Semester	120 ECTS 59 Kazakh Credit Points	Fall term 01.09.2011

According to the Self Study Report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor degree programme Biology:

The students receive a fundamental knowledge in biological sciences, can follow new directions in modern biology and are able to apply their knowledge in scientific and educational activities.

[3] EQF = The European Qualifications Framework for lifelong learning

The graduates:

- Are able to use existing software, use the basic knowledge and skills of information management solutions for professional research tasks.
- Know the main provisions of the traditional methods of teaching biology at school, and know the basic principles to design the educational content.
- Are able to perform logical, methodological and didactic analysis of learning content.
- Know the main plant kingdoms, the morphology, physiology and reproduction, geographical distribution and ecology of representatives of major plants species.
- Can describe and analyze the information obtained practically and present the results of field and laboratory biological research.
- Know the features of the basic types of animals, their place in the animal kingdom, as well as the peculiarities of individual development and can use their theoretical knowledge in practice and in experimental studies.
- Know the basics of biophysical and biochemical processes, of membrane and molecular mechanisms of life and can apply the methods of mathematical analysis and modeling in research.
- Understand the principles of cellular organization of biological objects in practical activities and know the basics and modern achievements of genetics, genomics.
- Can use methods of observation, description, identification, classification and cultivation of biological objects in experimental studies.
- Understand the role of evolutionary ideas in the biological worldview, have modern ideas about the basics of evolutionary theory of micro-and macroevolution and about the laws of reproduction and individual development of biological objects.
- Can apply the origin, development and diversification of biological objects in practice.

The following **curriculum** is presented:

Prerequisites	Cipher and name of the module	Discipline name	KZ credits	ECTS					
					Lecture	practice/ seminars	Lab	Studio	Self-study
1th semester									
General compulsory modules									
	History of Kazakhstan	History of Kazakhstan	3	4	2	1	0		6
	Kazakh (Russian) Language	Kazakh (Russian) Language	3	5	0	3	0		6
	Foreign language	Foreign language	3	4	0	3	0		6
	Ecology and sustainable deve-lopment	Ecology and sustainable deve-lopment	2	3	1	1	0		4
	Fundamentals of Life Safety	Fundamentals of Life Safety	2	3	1	1	0		4
	Sociology	Sociology	2	5	1	1	0		**4**
Compulsory modules on a specialty			**2**	**3**					**4**
	Botany	Structural Botany	2	3	1	0	1		4
Compulsory modules on a specialty			**2**	**3**					
	Pedagogy and psychology	Pedagogy and psychology	2	3	1	1	0		4

elective modules beyond qualifications (chose)			2						
	Religious	Religious	2		1	1	0		4
	Eurasianism: theory and practice	Eurasianism: theory and practice	2		1	1	0		4
Additional module (beyond the curriculum)									
	Physical Training	Physical Training	2						
Total in theoretical study			**19**	**30**					
Total in semester			**21**	**30**					
2nd semester									
General compulsory modules									
	Informatics	Informatics	3	4	1	2	0		**6**
Kazakh (Russian) Language	Kazakh (Russian) Language	Kazakh (Russian) Language	3	5	0	3	0		6
Foreign language	Foreign language	Foreign language	3	4	0	3	0		6
Compulsory modules on a specialty			**2**	**3**					
Botany	Botany	Systematics of plants	2	3	1	0	1		4
Compulsory modules on a specialty			**3**	**4**					6
	Anthropotomy	Anthropotomy	3	4	1	0	2		6
Compulsory modules on a specialty			**3**	**4**					
	Cell biology	Cytology, Histology	3	4	1	0	2		4
Elective modules 1 (chose)			**2**	**3**					

Botany	Mycology	Mycology	2	3	1	0	1		4
Botany	Reproduction of plants	Reproduction of plants	2	3	1	0	1		4
Additional module (beyond the curriculum)									
Botany	Training-field practice of botany	Training-field practice of botany	5	3					
Additional module (beyond the curriculum)									
	Physical Training	Physical Training	2						
Total in theoretical study			**19**	**27**					
Total in semester			**24**	**30**					
3rd semester									
General compulsory modules									
	Fundamentals of economics	Fundamentals of economics	2	3	1	1	0		4
Kazakh (Russian) Language	Professional Kazakh (Russian) language	Professional Kazakh (Russian) language	2	3	0	2	0		4
Foreign language	Professionally oriented foreign language	Professionally oriented foreign language	2	3	0	2	0		4
	Physics	Physics	3	4	2	0	1		6
	Chemistry	Chemistry	3	5	1	0	2		6
	Mathematics	Mathematics	3	4	1	2	0		6

	Politology	Politology	2	3	1	1	0		**4**
Compulsory modules on a specialty			**3**	**5**					6
	Zoology	Zoology of Invertebrates	3	5	2	0	1		6
Additional module (beyond the curriculum)									
	Physical Training	Physical Training	2						
Total in theoretical study			**20**	**30**					
Total in semester			20	**30**					
4th semester									
General compulsory modules									
	Philosophy	Philosophy	3	5	2	1	0		**6**
	Fundamentals of Law	Fundamentals of Law	2	3	1	1	0		4
Compulsory modules on a specialty			**3**	**5**					**6**
Zoology	Zoology	Zoology of vertebrates	3	5	2	0	1		6
Compulsory modules on a specialty			**3**	**5**					
Chemistry	Biochemistry	Biochemistry	3	5	2	0	1		6
Compulsory modules on a specialty			**3**	**5**					
Botany	Biometrics	Biometrics	3	5	2	1	0		6
Compulsory modules on a specialty			**3**	**4**					
Botany	Plant physiology	Plant physiology	3	4	1	0	2		6
Additional module (beyond the curriculum)									

Zoology	Teaching and field practice in zoology	Teaching and field practice in zoology	5	3					
Additional module (beyond the curriculum)									
	Physical Training	Physical Training	2						
Total in theoretical study			**17**	**27**					
Total in semester			**22**	**30**					
5th semester									
Compulsory modules on a specialty			**4**	**6**					
Cell biology	Genetics	Genetics	4	6	2	0	2		8
Compulsory modules on a specialty			**3**	**4**					
Zoology	Evolutional theo-ry	Evolution theory	3	4	1	2	0		
Compulsory modules on a specialty			**3**	**4**					
Physics	Biophysics	Biophysics	3	4	2	0	1		6
Compulsory modules on a specialty			**3**	**4**					
Cell biology	Molecular biology	Molecular biology	3	4	1	2	0		6
Elective modules 2 (chose)			**4**	**6**					**8**
Biochemistry	Biomedicine	Introduction of Medical biology	2	3	1	1	0		4
		Basics of Medical Biotechnology	2	3	1	1	0		4
Botany	Ecological biology	Ecology of animals	2	3	1	1	0		4

		Ecology of plants	2	3	1	1	0		4
Elective modules 3 (chose)			**4**	**6**					6
Biochemistry, Cell biology	Biological methods of study	Methods of Molecular biology and biochemistry	2	3	1	1	0		4
		Cytological and histological methods	2	3	1	1	0		2
Biochemistry	Economic botany	Pharmacognosy	2	3	1	1	0		4
		Phytopathology	2	3	1	1	0		2
Additional module (beyond the curriculum)									
	Physical Training	Physical Training	4						
Total in theoretical study			**21**	**30**					
Total in semester			**21**	**30**					
6 semester									
Compulsory modules on a specialty									
Cell biology	Microbiology	Microbiology	2	3	1	0	1		4
		Virology	2	3	1	0	1		4
Compulsory modules on a specialty									
Anthropotomy	Physiology of human and animals	Physiology of human and animals	3	5	2	0	1		6
Compulsory modules on a specialty									

Pedagogy and psychology	Methodics of teaching biology	Methodics of teaching biology	3	4	1	0	2		6
Compulsory modules on a specialty			**3**	**4**					
Botany	Bioresources of Kazakhstan	Bioresources of Kazakhstan	3	4	2	1	0		6
Elective modules 4 (chose)			4	6					8
Genetics	Human Genetics	Medical genetics	2	3	1	1	0		4
		Citogenetics	2	3	1	1	0		4
Physiology of human and animals	Biology of development	Biology of individual development	2	3	1	1	0		4
		Age physiology and school hygiene	2	3	1	1	0		4
Additional module (beyond the curriculum)									
	Industrial internship	Industrial internship	2	5					8
	Physical Training	Physical Training	2						
Total in theoretical study			**17**	**25**					
Total in semester			**19**	**30**					
7th semester									
Compulsory modules on a specialty									
Informatics	Introduction to the informational biology	Introduction to the informational biology	3	5	2	0	1		8

Elective modules 5 (chose)			**7**	**11**					14
Physiology of human and animals	Medical biology	Immunology	3	5	2	0	1		6
		Fundamentals of Molecular Medicine	4	6	2	0	2		8
Molecular biology	Structural organisation of genome	The organization of the genome of prokaryotic and eukaryotic	3	5	2	0	1		6
		Molecular virology	4	6	2	0	2		8
Elective modules 6 (chose)			**6**	**9**					
Physiology of human and animals	Basics of functional system	Functional morphology of organs and systems	3	4	2	0	1		6
		Higher nervous activity and physiology of behavior	3	5	2	0	1		6
Genetics	Gene and cell engineering	Genetics of development	3	4	2	0	1		6
		Gene engineering	3	5	2	0	1		6
Additional module (beyond the curriculum)									
	Teaching internship	Teaching internship	5	5					5

	Physical Training	Physical Training	2						
Total in theoretical study			**16**	**25**					
Total in semester			**21**	**30**					
8th semester									
Additional module (beyond the curriculum)									
	Pre-diploma practice	Pre-diploma practice	5	15					20
	State exam in speciality	State exam in speciality	1	5					6
	Writing and defense of a thesis (project)	Writing and defense of a thesis (project)	2	10					12
Total in theoretical study			0	0					
			8	**30**					
Total in theortetical study			**129**	**194**					
			156	**240**					

According to the Self Study Report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master degree programme Biology:

The students acquire in-depth knowledge in the field of classical biology and in new areas of modern biology (cell and molecular biology, genomics, etc.) and are capable to conduct fundamental and applied research.

The graduates:

- Understand modern molecular genetics, cellular technologies and mechanisms of biotransformation of foreign compounds.
- Understand the universality of basic structures and functions of cell components and cells in general, of forms of intercellular and molecular interactions, of main organizational features of eukaryotic genomes, prokaryotes and viruses and mechanisms of genetic processes.
- Are able to establish cause-effect relationships among structures and functions of biological objects.
- Can use the obtained knowledge to solve problems in breeding, medicine, ecology and biotechnology, as well as apply this knowledge in research.
- Know and understand the main environmental problems and their influence on biological diversity.
- Understand evolutionary process regulations, to assess the biological conditions and to analyze the structural and functional organization of biogeocenotic systems.
- Know the mechanisms of the fundamental processes of excitation and inhibition.
- Know and understand the functions and patterns of the nervous system and the coordination mechanisms of reflex activity; multifactorial diseases and carcinogenesis;
- Understand the basic concepts, issues and problems of plant physiology, plant pathology, and biotechnology; mechanisms of sustainability and adaptation ways to different unfavorable environmental factors.
- Are capable to establish the diagnosis of diseased plants and can develop a working plan for implementing protective measures in specific circumstances.
- Can apply diagnostic methods of determining crop diseases and their pathogens, methods of predicting the timing and occurrence of disease and the intensity of their development, methods for controlling harmful pathogens.

The following **curriculum** is presented:

Prerequisites	Cipher and name of the module	Discipline name	KZ credits	ECTS					
					Lecture	practice/ seminars	Lab	Studio	Self-study
1th semester									
General compulsory modules									
Philosophy	History and philosophy of science	History and philos-ophy of science	2	4	1	1			4
Foreign Language	Foreign lan-guage	Foreign language	2	4		2			4
Obligatory module according to the speciality									
Cytology and histology	Cell biology	Cell biology	2	4	1	1			4
Elective module 1(choose one)			**4**	**7**					**8**
Environment and Sustainable Development	Environment and biodiversity	Learning obout the environment	2	4	1	1			4
		Conservation of biological diversity	2	3	1	1			4
Genetics	Gene Expressi-on	Regulation of gene expression	2	4	1	1			4

		Cell cycle Genetics	2	3	1	1			4
Elective module 2 (choose one)			**4**	**7**					**8**
Theory of evelution	Evolutionary Biology	Theory of the origin of life	2	4	1	1			4
		Development of evolutionary ideas in biology	2	3	1	1			4
Anthropotomy	Human Physiology	Physiology of excitable tissues	2	4	1	1			4
		Physiology of the central nervous system	2	3	1	1			4
Additional module									
	Research work of a masters	Research work of a masters	1	4					7
Total in theoretical study			**14**	**26**					
Total in semester			**15**	**30**					
2nd semester									
General compulsory modules									
Pedagogy and Psychology	Pedagogy	Pedagogy	2	3	1	1			4
Pedagogy and Psychology	Psychology	Psychology	2	3	1	1			4
Elective module 3(choose one)			4	7					
Molecular biology	genetic Engi-neering	genetic Engineering	4	7	2	2			8

Biochemistry, Plant physiology	Selected chapters of biotechnology	Selected chapters of biotechnology	4	7	2	2			8
Elective module 4(choose one)			**6**	**9**					
Genetics	Molecular mechanisms of genetics processes	Basic molecular and genetic processes	3	5	2	1			6
		Structure and organization of the genome	3	4	2	1			6
Botany, biochemistry ,plant physiology	Modern problems of microbiology	Medical microbiology	3	5	2	1			6
		Genetics of Microorganisms	3	4	2	1			6
Additional module									
	Research work of a masters	Research work of a masters	2	8					14
Total in theoretical study			**14**	**22**					
Total in semester			**16**	**30**					
3rd semester									
Elective module 5(choose one)			**4**	**6**					**8**
Biology of the Cell,Genetcs	Cell Technologies	Selected chapters of pharmbiotechnology	2	3	1	1			4

		The latest molecular genetics and cellelar technologies	2	3	1	1			4
	Biology and Biotechnology	Selected chapters of Mycology	2	3	1	1			4
		Genetics and plant immunity	2	3	1	1			4
Elective module 6 (choose one)			**4**	**6**					**8**
Botany biochemistry, Botany	Phytopathology	Phytopathology	4	6	2	2			8
	Molecular genetics	Mutagenesis and DNA- repair	2	3	1	1			4
		Eukaryotic genome	2	3	1	1			4
Elective module 7 (choose one)			**3**	**4**					**6**
	Molecular endocrinology	Molecular basis of Endocrinology (Molecular basis of hormone action in the target cell)	2	2	2	1			4
		Genetics of multi-factorial diseases and cancer	1	2	1				2

Botany	Ecology of anthropogenic landscapes	Ecology of anthropogenic landscapes	3	4	2	1			6
Elective module 8 (choose one)			3	4					
Biochemistry	Molecular mechanisms of toxic processes	Molecular mechanisms of toxic processes	3	4	2	1			6
Environment and Sustainable Development	Cognitive ecology	Behavior of animals and humans	3	4	2	1			6
Additional module									
	Educational Practices	Educational Practices	3	2					3
	Research work of a masters, including the implementation of masters dissertation	Research work of a masters, including the implementation of masters dissertation	2	8					14
Total in theoretical study			**14**	**20**					
Total in semester			**19**	**30**					
4th semester									
Additional module									
	Research Practice	Research Practice	3	12					21

	Research work of a masters, including the implementation of masters dissertation	Research work of a masters, including the implementation of masters disserta-tion	2	8					14
final attestation									
	Comprehensive exam	Comprehensive exam	1	3					6
	Registration and protection of the masters thesis	Registration and protection of the masters thesis	3	7					18
Total in semester			**9**	**30**					
Total in theoretical study			**42**	**68**					
Total in module educational programme			**59**	**120**					

According to the Self Study Report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor degree programme Biotechnology:

The students are capable to navigate in space of modern biotechnology, know the latest developments and research trends. They can implement their practical knowledge in the areas of industrial, medical, agricultural and environmental biotechnology.

The graduates:

- Can explain the nature, mechanisms and patterns of the vital processes of living organisms (microorganisms, plants, animals).
- Know and understand animal systematic, evolution morphology and the biology of systematic groups and units.
- Acquire the skills to identify species and to navigate the biodiversity programs used in the ecological world.
- Have skills at lab work with plant objects.
- Possess the methods to analyze material containing microorganisms and to isolate and identify microorganisms.
- Know and understand the theoretical and methodological foundations of the biochemistry of living organisms.
- Can use modern physiology methods of research to study plants, animals and humans, and the inside processes.
- Know the main application areas of food biotechnology achievements in food production and the physical and chemical basis of food products based on biotechnology.
- Can collect and analyze biomedical and biophysical information in biotechnological systems and technologies.
- Are able to use modern biotechnology equipment and scientific instruments.
- Understand the impact of environmental factors on the genotype of microorganisms, plants and animals in order to maximize their productivity.
- Acquire skills in planning genetic engineering experiments.

The following **curriculum** is presented:

Prerequisites	Cipher and name of the module	Discipline name	KZ credits	ECTS	Volume of curriculum				
					Lecture	Practice/Seminar	Lab	Studio	Self study
1st semester									
General compulsory modules									
	History of Kazakhstan	History of Kazakhstan	3	5	2	1			6
	Sociology	Sociology	2	3	1	1			4
	Kazakh (russian) language	Kazakh (russian) language	3	4	0	3			6
	Foreign language	Foreign language	3	4		3			6
	Ecology and sustainable development	Ecology and sustainable development	2	3	1	1			4
	Fundamentals of life safety	Fundamentals of Life Safety	2	3	1	1			4
Compulsory modules									
	Physics	Physics	3	4	2	1			6
Compulsory module on speciality 1									
	Anatomy and morphology of plants	Anatomy and morphology of plants	3	4	2	1			6
Additional module									

	Physical Training	Physical Training	2						
Total in theoretical study			**21**	**30**					
Total in semester			**23**	**30**					
2nd semester									
General compulsory modules									
	Informatics	Informatics	3	4	1	2			6
	Foreign language	Foreign language	3	3		3			6
	Kazakh (russian) language	Kazakh (russian) language	3	3		3			6
Compulsory modules									
	General Chemistry	General Chemistry	2	3	1	1			4
	Organic chemistry	Organic chemistry	3	4	2	1			6
	Mathematics	Mathematics	4	5	2	2			8
Compulsory module on speciality 2									
	Biodiversity of animals	Biodiversity of animals	2	5	1		1		4
Additional module									
	Educational practice	Educational practice	2	3					
	Physical Training	Physical Training	2						
Module beyond the curriculum (choose one)									
	Eurasianism: Theory and Practice	Eurasianism: Theory and Practice	2		1	1			4

	Religious studies	Religious studies	2		1	1			4
Total in theoretical study			**20**	**27**					
Total in semester			**26**	**30**					
3rd semester									
General compulsory modules									
	Politology	Politology	2	4	1	1			4
	Fundamentals of economics	Fundamentals of economics	2	4	1	1			4
Compulsory modules									
	Professional Kazakh (Russian) language	Professional Kazakh (Russian) language	2	3	1	1			4
	Subjects of biotechnology	Subjects of biotechnology	4	5	2	2			8
Compulsory module on speciality 3									
	Biochemistry	Biochemistry	3	4	2	1			6
	Plant physiology	Plant physiology	3	4	2	1			6
Elective module 1 (choose one)									
	Human and animal physiology	Modern methods of physiological experiment	2	3	1	1			4

		Selected chapters of human and animal physiology	2	3	1	1			4
	Biophysics	Basics of biophysics	2	3	1	1			4
		Medical biophysics	2	3	1	1			4
Additional module									
	Physical Training	Physical Training	2						
Total in theoretical study			**20**	**30**					
Total in semester			**22**	**30**					
4th semester									
General compulsory modules									
	Fundamentals of Law	Fundamentals of Law	2	3	1	1			4
	Philosophy	Philosophy	3	4	2	1			4
Compulsory modules									
	Professionally oriented foreign language	Professionally oriented foreign language	2	3	0	2			4
Compulsory modules									
	Fundamentals of biotechnology	Fundamentals of biotechnology	3	4	2	1			6

Compulsory module on speciality 4									
	Microbiology and virology	Microbiology and virology	3	5	2	1			6
Elective module 2 (choose one)									
	Basics of breeding	Basics of breeding animals	2	3	1	1			
		Basics of breeding plants	3	5	2	1			
	Plant metabolism	Secondary metabolites of plants	2	3	1	1			
		Stress resistance of plants	3	5	2	1			
Additional module									
	Educational practice	Educational practice	2	3					
	Physical Training	Physical Training	2						
Total in theoretical study			**18**	**27**					
Total in semester			**22**	**30**					
5th semester									
Compulsory modules									
	Processes and devices of biotechnology	Processes and devices of biotechnology	2	5	1	1			4
Compulsory module on speciality 5									

	Molecular Biology	Molecular Biology	3	5	2	1			6
	Biotechnology of microorganisms	Biotechnology of microorganisms	3	5	2	1			6
	General and molecular genetics	General and molecular genetics	3	5	2	1			6
Elective module 3 (choose one)									
	Biotechnology of protein drugs and BAS	Biotechnology of protein drugs production	3	5	2	1			6
		Biotechnology of BAS production	3	5	2	1			6
	Enzyme Engineering	Basic Enzyme Engineering	3	5	2	1			6
		Immobilized enzymes and cells	3	5	2	1			6
Additional module									
	Physical Training	Physical Training	4						
Total in theoretical study			**17**	**30**					
Total in semester			**21**	**30**					
6th semester									
Compulsory module on speciality 6									

	Plant biotechnology	Plant biotechnology	3	5	2	1			6
	Animal biotechnology	Animal biotechnology	3	4	2	1			6
	Methods of teaching biology	Methods of teaching biology	3	4	2	1			6
	Food biotechnology	Food biotechnology	3	4	2	1			6
Elective module 4 (choose one)									
	Virology	Moleculular virology	3	5	2	1			6
		Oncogenic viruses	3	5	2	1			6
	Basics of cell and genetic engineering	Genetic engineering	3	5	2	1			6
		Methods of stem cells generating and application	3	5	2	1			6
Additional module									
	Industrial internship	Industrial internship	2	3					4
	Physical Training	Physical Training	2						
Total in theoretical study			**18**	**27**					
Total in semester			**22**	**30**					
7th semester									

Compulsory module on speciality 7									
	Molecular biotechnology	Molecular biotechnology	3	5	2	1			6
	Medical biotechnology	Medical biotechnology	3	5	2	1			6
	Environmental biotechnology	Environmental biotechnology	3	5	2	1			6
Elective module 5 (choose one)									
	Applied immunobiotechnology	Methods of immunological investigations	3	5	2	1			6
		Basics of industrial immunobiotechnology	3	5	2	1			6
	Contemporary studies on genome expression	Proteomics	3	5	2	1			6
		Genomics	3	5	2	1			6
	Industrial biotechnology	Selection of industrial strains of microorganisms	3	5	2	1			6
		Microbial technology	3	5	2	1			6
Additional module									
	Teaching internship	Teaching internship	2	5					2

	Physical Training	Physical Training	2						
Total in theoretical study			**15**	**25**					
Total in semester			**19**	**30**					
8th semester									
Additional module									
	Industrial internship	Industrial internship	6	16					12
	State exam in speciality	State exam by speciality	1	4					6
	Writing and defense of a thesis /project/	Writing and defense of a thesis (project)	2	10					12
			9	**30**					
Total in theoretical study			**129**	**196**					
			164	**240**					

According to the Self Study Report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master degree programme Biotechnology:

The students are capable to develop and master the technologies based on the large-scale implementation of biotechnology achievements in key industries, social infrastructure and healthcare.

The graduates:

- Know and understand the theoretical and methodological foundations of biochemistry and the physical and chemical basis for the functioning of living organisms.
- Are able to use modern methods of molecular genetics and molecular biology in practice and have the skills to design and plan research tasks in theoretical and practical biochemistry.
- Can design and develop training and educational materials to conduct educational processes in secondary schools, high schools, colleges of biotechnological, biological, medical and agricultural profile.
- Know the latest achievements in plant biotechnology, animal biotechnology, microbiological, food, environmental and molecular biotechnology.
- Are able to identify, select, cultivate basic forms of microorganisms, plant and animal cells and acquire the skills of planning, organizing and carrying out research in the field of plant biotechnology, animal and micro-organisms.
- Can present the results of their research in the form of scientific and technical reports using modern information technologies.
- Are prepared to conduct biomedical, environmental, and scientific and technological research using technical means, information technology and methods of processing results.
- Possess knowledge of modern methods of biotechnology: cell cultures of plants, animals and micro-organisms genetically engineered alien gene transfer techniques, transformation, producing genetically modified foods; own methods of analysis and control of safety of biotechnology products.
- Understand microbiological methods, principles and techniques used in the various sectors of biotechnology and can analyze and predict changes in supply and demand for biotechnology products.

- Can use biomedical and veterinary approaches to create diagnostic and medical products via methods of medical biotechnology.
- Have an understanding of the basic mechanisms of epigenetic and genetic processes, providing variability of organisms and have knowledge of modern biotechnology techniques in agriculture and crop production.
- Understand the features of a modern market economy: ownership and management: structure of justice, assignment of law agreement responsibilities, economic interests, goals and means, the problem of choosing the optimal solutions, and economic strategy economic policy, competition and species in the field of biotechnology.

The following **curriculum** is presented:

Prerequisites	Cipher and name of the module	Discipline name	KZ credits	ECTS					
					Lecture	practice/ seminars	Lab	Studio	Self-study
1st semester									
General compulsory modules									
Philosophy	History and philosophy of science	History and philosophy of science	2	4	1	1			4
Foreign language	Foreign language	Foreign language	2	4		2			4
			4	**8**					
Compulsory module			**6**	**12**	**4**	**2**			
General genetics	Molecular genetic bases of biotechnology	Molecular genetic bases of biotechnology	3	6	2	1			6
Ecological Biotechnology	Modern aspects of biotechnology in the field of environmental protection	Modern aspects of biotechnology in the field of environmental protection	3	6	2	1			6
Elective module (choose one)			**3**	**6**	**2**	**1**			**6**
Microbiology and virology	Molecular diagnostics and gene therapy	Molecular diagnostics and gene therapy	3	6	2	1			6

Microbiology and virology	Biologically active substances of medicinal plant cell cultures	Biologically active substances of medicinal plant cell cultures	3	6	2	1			6
Additional module (beyond the curriculum)									
	Scientific-research work of graduate students (master)	Scientific-research work of graduate students (master)	1	4					7
Total in theoretical study			**13**	**26**					
Total in semester			**14**	**30**					
2nd semester									
General compulsory modules									
	Pedagogics (high school)	Pedagogics	2	3	1	1			4
	Psychology	Psychology	2	3	1	1			4
Compulsory modules on a specialty			**2**	**3**	**1**	**1**			**4**
Ecological Biotechnology	Modern methods in biotechnology	Modern methods in biotechnology	2	3	1	1			4
Compulsory modules on a specialty			**6**	**8**	**4**	**2**			

Biotechnological Production	Methods of isolation and study of biosynthesis and biotransformation products	Methods of isolation and study of biosynthesis and biotransformation products	3	4	2	1			6
Biotechnological Production	Methods of isolation and study of biological compounds	Methods of isolation and study of biological compounds	3	4	2	1			6
Elective modules (choose one)			**3**	**6**	**2**	**1**			
Molecular Genetics	Drugs biotechnology	Biotechnology of vaccines production	2	4	1	1			4
		Biotechnology production of diagnostic preparations	1	2	1				2
Biochemistry	Biotechnology and bioengineering in plant breeding	Classic and modern approaches in plant breeding	2	4	1	1			8
		Ecological aspects of plant breeding	1	2	1				4
Additional module (beyond the curriculum)									

	Scientific-research work of graduate students (master)	Scientific-research work of graduate students (master)	2	7					14
Total in theoretical study			**15**	**23**					
Total in semester			**17**	**30**					
3rd semester									
Additional module (beyond the qualifications)			**4**	**6**					
Ecological Biotechnology	Modern appliances and scientific equipment in biotechnology	Biotechnology industrial companies equipment	2	3	1	1			4
		Modern scientific equipment in biotechnology	2	3	1	1			4
	Methodology of scientific research	Methodological bases of research in biotechnology	2	3	1	1			4
		Scientific experiment planning	2	3	1	1			4
Elective modules (choose one)			**4**	**6**					
Biochemistry	Plant stress biology	Biochemical basics of oxidative stress	2	3	1	1			4

		Biology of reacive oxygen species	2	3	1	1			4
Molecular Genetics	Postgenomic mechanisms of gene regulation	Molecular bases of epigenetics	2	3	1	1			4
		Post-transcriptional mechanisms of gene regulation	2	3	1	1			4
Elective modules (choose one)			**6**	**8**					
Biochemistry	Bases of molecular DNA technology	Molecular genomics	3	4	2	1			6
		Protein engineering	3	4	2	1			6
Biochemistry	Biological macromolecules research methods	Protein studying methods	3	4	2	1			6
		Nucleic acids studying methods	3	4	2	1			6
Additional module (beyond the curriculum)									
	Teaching practice	Teaching practice	3	3					3

	Scientific-research work of graduate students (master)	Scientific-research work of graduate students (master)	2	7					14
Total in theoretical study			**14**	**23**					
Total in semester			**19**	**30**					
4th semester									
Additional module (beyond the curriculum)									
	Research practice	Research practice	3	12					21
	Scientific-research work of graduate students (master)	Scientific-research work of graduate students (master)	2	8					14
final examination									
	Comprehensive examination	Comprehensive examination	1	3					6
	Fulfillment and defense of the master's thesis	Fulfillment and defense of the master's thesis	3	7					18
			9	**30**					
Total in theoretical study			**42**	**76**					
			59	**120**					

According to the Self Study Report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor degree programme Ecology:

The students acquire a fundamental knowledge in general and applied ecology, conservation and rational nature management, know new directions of modern ecology and are capable to apply their knowledge in scientific and practical activities.

The graduates:

- Are capable to define features of living systems, the basics of the relationship between a living organism and the environment,
- Know and understand the theoretical basis of the evolution of the biosphere, the main regularities of biodiversity and its differentiation in geographic space and time, basic ecology of populations, communities and ecosystems.
- Possess the skills to identify and characterize biological diversity and its modern methods of quantitative evaluation of information processing.
- Are able to use the theoretical knowledge in practice and in experimental studies.
- Can determine the mutagenic and genotoxic environmental factors in addressing environmental problems and understand the basics of toxicology as a scientific basis for global as well as for regional environmental problems.
- Know and understand the theoretical foundations and applied directions of geoecology and are able to solve global and regional geo-ecological problems.
- Are able to predict the state of the environment on the basis of geo-ecological research methods and possess the skills of determining the impact of the influence of anthropogenic factors on the individual components of the environment.
- Possess the theoretical foundations of environmental monitoring, regulation and reduction of environmental pollution, man-made systems and environmental risks and have the ability to use their theoretical knowledge in practice.
- Have an idea about the basic problems of social ecology and stages of interaction between society and nature and can define composition and place distribution of the population, workforce, regional features the lifestyle of people, problems of urbanization and health.
- Have a general understanding of soil and its genesis, the scientific understanding of the factors and characteristics of the soil-forming process; foundations of modern soil

classification and can carry out morphological description of soil; diagnose major soil types.

- Know the legal, economic and organizational methods of providing environmental safety and can use their knowledge to protect the environment.
- Can apply the necessary ways of describing models, including the division of the object into relatively homogeneous interacting parts, understand the types of mathematical models to determine the values and formulas to calculate corresponding outcomes.
- Possess knowledge of geo-environmental and ecological systems research methods and can use modern computer technology and specialized software in their research work.

The following **curriculum** is presented:

Prerequisites	Cipher and name of the module	Discipline name	KZ credits	ECTS					
					Lecture	practice/ seminars	Lab	Studio	Self-study
1st semester									
General compulsory modules									
	History of Kazakhstan	History of Kazakhstan	3	5	2	1			6
	Foreign language	Foreign language	3	5		3			6
	Kazakh (Russian) language	Kazakh (Russian) language	3	5		3			6
	Ecology and sustainable development	Ecology and sustainable development	2	3	1	1			4
	Sociology	Sociology	2	3	1	1			4
	Fundamentals of Life Safety	Fundamentals of Life Safety	2	3	1	1			4
Obligatory module according to the speciality									
	Biodiversity of plants, animals and microorganisms	Biodiversity of plants, animals and microorganisms	3	6	1	2			6
Elective modules (choose one)			**2**						

	Eurasianism: Theory and Practice		2		1	1			
	Religion Studies	Religion Studies	2		1	1			
Additional module (beyond the curriculum)									
	Physical Education	Physical Education	2						
Total in theoretical study			**18**	**30**					
Total in semester			**22**	**30**					
2nd semester									
General compulsory modules									
	Computer science	Informatics	3	5	1	2			6
	Kazakh (Russian) language	Kazakh (Russian) language	3	5		3			6
	Foreign language	Foreign language	3	5		3			6
Obligatory module according to the speciality									
	Chemistry	Chemistry	2	3	1	1			4
	Biology	Biology	2	3	1	1			4
Elective module 2 (chose)			**5**	**7**					
	The organization of scientific researches in ecology	Biometry	3	4	2	1			6
		Bioindicator methods of research	2	3	1	1			4

	Geoecological research	Statistical processing of ecological research	3	4	2	1			6
		Methods of geoecological research	2	3	1	1			4
Additional module									
	Educational and observational practice	Educational and observational practice	4	2					
	Physical Education	Physical Education	2						
Total in theoretical study			**18**	**28**					
Total in semester			**24**	**30**					
3rd semester									
General compulsory modules									
	Politology	Politology	2	3	1	1			4
	Fundamentals of economics	Fundamentals of economics	2	3	1	1			4
Compulsory module according to the speciality									
	Professional Kazakh (Russian) language	Professional Kazakh (Russian) language	2	3		2			4

	Professionally oriented foreign langua-ge	Professionally oriented foreign language	2	3		2			4
Compulsory module according to the speciality									
Ecology and sustainable development	Ecological as-pects of natural sciences	Ecological as-pects of natural sciences	3	4	2	1			6
Ecology and sustainable development	Bioecology	Bioecology	2	3	1	1			4
Elective module 3 (choose one)			**4**	**6**					
Ecology and sustainable development	Social ecology	Social ecology and sustainable development	2	3	1		1		4
		Fundamentals of Medical Eco-logy	2	3	1	1			4
Ecology and sustainable development	Social geoecology	Social ecology and sustainable development	2	3	1		1		4
		Medical geography	2	3	1	1			4
Elective module 5 (choose one)			**3**	**5**					
	Demecology and cynecology	Population Eco-logy	2	3	1	1			4
		Biocenology	1	2	1				2
	Use of water resources	Hydroecology	2	3	1	1			4

		Rational usage of the hydro-sphere	1	2	1				2
Additional module									
	Physical Educa-tion	Physical Educa-tion	2						
Total in theortetical study			**20**	**30**					
Total in semester			**22**	**30**					
4th semester									
General compulsory module									
	Philosophy	Philosophy	3	5	2	1			6
	Fundamentals of Law	Fundamentals of Law	2	3	1	1			4
Compulsory module according to speciality									
Ecology and sustainable development	Origin and evolution of the biosphere	Origin and evo-lution of the biosphere	3	5	2	1			6
Elective module 4 (choose one)			**5**	**8**					
Ecology and sustainable development	Global envi-ronmental problems and ecology of Kazakhstan	Global ecology	2	3	1	1			4
		Ecology of Kazakhstan	2	3	1	1			4
		Nature reserve	1	2	1				2
Ecology and sustainable development	Geoecological aspects of urbanization	Urboecology	2	3	1	1			4
		Megalopolis ecology	2	3	1	1			4
		The general earth science	1	2	1				2
Elective module (choose one)			**4**	**7**					

Ecology and sustainable development	Engineering environment	Industrial ecology	2	4	1	1			4
		Engineering protection of environment	2	3	1	1			4
Ecology and sustainable development	Industrial ecology	Industrial ecology	2	4	1	1			4
		Waste management	2	3	1	1			4
Additional module									
	Educational and field externship	Educational and field externship	4	2					
	Physical Training	Physical Training	2						
Total in theoretical study			**17**	**28**					
Total in semester			**23**	**30**					
5th semester									
Compulsory module according to speciality									
	Biochemistry and Ecotoxicology	Biogeochemistry and Ecotoxicology	3	6	1	2			6
	Geoecology	Geoecology	3	6	2	1			6
Elective module 6 (choose one)			**4**	**8**					
Origin and evolution of the biosphere	Environmental protection	Study about the environment	3	6	2		1		6

		The prediction of environmental state	1	2	1				2
Ecology and sustainable development	Geosphere land and its protection	Study about the environment	3	6	2		1		6
		Climatology and meteorology	1	2	1				2
Elective module 7 (choose one)			**6**	**10**					
Origin and evolution of the biosphere	Ecological audit and safety	Environmental regulation and expertise	2	4	1	1			4
		Ecological audit	2	3	1	1			4
		Environmental Impact Assessment	2	3	1	1			4
Origin and evolution of the biosphere	Tourism and recreation	Environmental regulation and expertise	2	4	1	1			4
		Ecotourism	2	3	1	1			4
		Landscape science and recreational ecology	2	3	1	1			4
Additional module									
	Physical Education	Physical Education	4						
Total in theoretical study			**16**	**30**					

Total in semester			**20**	**30**					
6th semester									
General compulsory modules									
Ecology and sustainable development	Ecologycal resource science	Ecologycal resource science	4	7	2	2			8
Biochemistry and Ecotoxicology	Ecological monitoring	Ecological monitoring	2	3	1	1			4
Elective module 8 (choose one)			**4**	**7**					
	Rational of environmental management	Mechanisms of environmental management	3	5	2	1			6
		Protection of natural resources	1	2	1				2
	Complex sciences about the earth	Geology	3	5	2	1			6
		Hydrology	1	2	1				2
Elective module 9 (choose one)			**5**	**8**					
Geoecology	Ecology of soil science	Soil science	3	5	2		1		6
		Rational use of land resources	2	3	1	1			4
Geoecology	Soil science and earth science	Soil science	3	5	2		1		6
		Geomorphology	2	3	1	1			4
Additional module									
	Industrial internship	Industrial internship	2	5					

	Physical Education	Physical Education	2						
Total in theoretical study			**15**	**25**					
Total in semester			**19**	**30**					
7th semester									
Compulsory module according to speciality									
Ecological monitoring	Fundamentals of System Ecology	Fundamentals of System Ecology	3	5	2	1			6
Elective module 10 (choose one)			**5**	**8**					
Fundamentals of Law	Environmental Law, Management and Marketing	Fundamentals of Environmental Law, Management and Marketing	3	5	2		1		6
		International project management	2	3	1	1			4
Fundamentals of Law	Environmental management	Environmental law, management and marketing in Geoecology	3	5	2		1		6
		International environmental conventions	2	3	1	1			4
Elective module 11 (choose one)			**5**	**8**					

Ecology and sustainable development	Modeling of ecosystems	Mathematical modeling in ecology	3	5	2		1		6
		Modeling of ecosystems	2	3	1	1			4
Geoecology	Modeling of geosystems	Mathematical modeling in ecology	3	5	2		1		6
		Ecological mapping	2	3	1	1			4
Elective module 12 (choose one)			**6**	**9**					
Ecology and sustainable development	Environment and genotoxic factors	Mutagenesis and Environment	2	3	1	1			4
		Environmental biotechnology	2	3	1	1			4
		The human environment	2	3	1	1			4
Ecology and sustainable development	Biotic aspects of geoecology	Paleogeography	2	3	1	1			4
		Paleoecology	2	3	1	1			4
		Modern biogeography	2	3	1	1			4
Additionl module									
	Physical Education	Physical Education	2						
Total in theoretical study			**19**	**30**					
Total in semester			**21**	**30**					
8th semester									

Elective module 13 (choose one)			**6**	**9**					
Ecology and sustainable development	Big practice of ecology	Big practice of microbiology	2	3	1	1			4
		Big practice on systematization of plants	2	3	1	1			4
		Big practice on systematization of animals	2	3	1	1			4
Ecology and sustainable development	Big practice of geoecology	Big practice of microbiology	2	3	1	1			4
		Big practice on systematization of plants and animals	2	3	1	1			4
		Geoinformation systems	2	3	1	1			4
Additional module									
	Pre-diploma work externship	Pre-diploma work externship	3	12					12
	State examination on speciality	State examination on speciality	1	3					6

	Defense of Bachelor de-gree diploma work	Defense of Bachelor degree diploma work	2	6					12
Total in theortetical study			6	9					
			12	**30**					
Total in theortetical study			**131**	**210**					
			163	**240**					

According to the Self Study Report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master degree programme Ecology:

The students acquire an in-depth knowledge in ecology and environment protection, are adapted to market and technologies requirements, are capable to work in a team and to research the structure and links between sections of ecology.

The graduates:

- Understand the principles of sustainable development of nature and society; the basic tenets of the theory of environmental risk and assessment methods; the principles of optimization of natural and man-made landscapes and function and protection of the natural heritage.
- Are able to use research methods of physiological processes that sustain plant and animal organisms to various stress factors and possess the skills of planning, organizing and carrying out research in ecology.
- Can apply laws of functioning of natural and artificial ecosystems and can apply their theoretical knowledge in practice.
- Can determine the effect of various environmental factors on the crop, the relationship between organisms in agrophytocenosis.
- Possess methods of research into the problem of intensification of agricultural production: environmental pollution, and the products obtained with various pollutants, soil degradation, violations of the cycle of matter.
- Have research skills in the basics of environmental microbiology; physiology and methods of quantifying microorganisms and can-suggest new ways to apply microorganisms in environmental biotechnology.
- Can assess environmental impact and justify economic and other activities in the development of technical projects, public programs and other documents in accordance with applicable law.
- Can carry out an environmental assessment at the project level and at the level of "strategic" documents (development plans or industries, programs, policies, strategies, etc.) and can assess the condition and dynamics of human impact on the environment.
- Are able to analyze the structural and functional organization of landscapes cones; apply their knowledge to solve scientific, industrial and practical problems.

- Can define the regularities of the spatial distribution of meteorological and climatic fields across the globe, the basics of hydrodynamics of the atmosphere, different methods of weather forecast in advance the basic understanding of the mechanisms that lead to climate change, the role of the anthropogenic component in this process.
- Understand the methods of its research to address environmental challenges and are able to use the theoretical knowledge in practice and in experimental studies.
- Can assess the contribution of various sources of energy in the economy and the environment; total energy cycle scheme; classification of energy sources for their environmental impact, the role of resource-saving and low-waste technologies in addressing environmental problems.
- Possess the skills of assessing the impact of energy on the environment; skills assessment of prognosis impact energy on ecosystems; creation of a modern presentation of the concepts, strategies and practical problems of sustainable development in different countries and the Republic of Kazakhstan.

The following **curriculum** is presented:

Prerequisites	Cipher and name of the module	Name of Module	KZ credits	ECTS					
					Lecture	practice/ seminars	Lab	Studio	Self-study
1st semester									
General compulsory modules									
	Pedagogy	Pedagogy	2	3	1	1			4
Foreign language	Foreign language	Foreign language	2	3	1	1			4
	History and philosophy of science	History and philosophy of science	2	3	1	1			4
compulsory modules 1									
Ecology and sustainable development	Environment and conservation of biological diversity	Environment and conservation of biological diversity	2	3	1	1			4
compulsory modules 2									
Ecology and sustainable development	Modern environmental problems	Modern environmental problems	2	3	1	1			4
Elective module 1 (choose one)			**4**	**7**					
Ecology and sustainable development	Ecological physiology	Vegetative and endocrine mechanisms of adaptation	2	3	1	1			4
		Ecological epidemiology and ecopathology	2	4	1	1			4
Ecology and sustainable development	Agroecology	Agroecology and land management	2	3	1	1			4

		Bioremediation and biological cultivation of lands	2	4	1	1			4
Elective module 2 (choose one)			**2**	**4**					
	Comprehensive assessment of natural and industrial potential of the area	Comprehensive assessment of natural and industrial potential of the area	2	4	1	1			4
	Regional geo-ecological assessment of the area	Regional geo-ecological assessment of area	2	4	1	1			4
additional types of training									
	Scientific-research work of postgraduate	Scientific-research work of postgraduate	1	4					7
Total in theortetical study			**16**	**26**					
Total in semester			**17**	**30**					
2nd semester									
General compulsory modules									
	Psychology	Psychology	2	3	1	1			4
Essential module in speciality									
Ecology and sustainable development	Rational use of resources	New technologies and sustainable use of biological raw materials	2	3	1	1			4
Elective module 3 (choose one)			**4**	**7**					

Modern problems of Ecology	Medical aspects of sustainble development	Ecotoxicology	2	3	1	1			4
		Medical and ecological bases of susteinable development	2	4	1	1			4
Geoecology	Geoecology	Landscapes of fans	2	3	1	1			4
		Regional paleography and paleoecology	2	4	1	1			4
Elective module 4 (choose one)			**4**	**7**					
Production ecology	Analysis of the components of the environment	Physico-chemical analysis of the components of the environment	2	3	1	1			4
		The methodology and instrumentation in the study of environmental components	2	4	1	1			4
Sociology	Environmental policy and management	Ecology of military space activities	2	3	1	1			4
		Environmental policy and legal basis for environmental management	2	4	1	1			4
Elective module 5 (choose one)			**2**	**3**					
Psychology	Interaction psychology with environment	Interaction psychology with environment	2	3	1	1			4

	Organization and planning of scientific process	Organization and planning of scientific process	2	3	1	1			4
additional types of training									
	Scientific-research work of gpostgraduate	Scientific-research work of gpostgraduate	2	7					14
Total in theortetical study			**14**	**23**					
Total in semester			**16**	**30**					
3rd semester									
Elective module 6 (choose one)			**4**	**6**					
Ecology and sustainable development	Ecological microbiology and environmental biotechnology	Environmental biotechnology in agriculture and mining industry	2	3	1	1			4
		Ecological microbiology	2	3	1	1			4
Production ecology	Water resources	Ecological aspects of water treatment technologies	2	3	1	1			4
		Integrated water resources management	2	3	1	1			4
Elective module 7 (choose one)			**4**	**6**					
Modern problems of Ecology	Ecological security	Ecological aspects of security in the energy sector	2	3	1	1			4
		Management of ecological safe processes and production	2	3	1	1			4

Modern problems of Ecology	Ecological assessment and the quality of the air environment	Environmental assessment of development projects	2	3	1	1			4
		Physics of the atmosphere and air quality	2	3	1	1			4
Elective module 8 (choose one)			**4**	**6**					
Ecology and sustainable development	Environmental assessment and expertise	Environmental assessment and examination of design documentation	2	3	1	1			4
		Assessment of the status and dynamics of the human impact on the environment	2	3	1	1			4
Modern problems of Ecology	Management of pollutants environment	Strategy for protection the environment from pollution	2	3	1	1			4
		Management of hazardous waste	2	3	1	1			4
additional types of training									
	Pedagogical practice	Pedagogical practice	3	3					3
	Scientific-research work of postgraduate	Scientific-research work of postgraduate	2	9					14
Total in theortetical study			**12**	**18**					
Total in semester			**17**	**30**					
4th semester									
additional types of training									
	Research practice	Research practice	3	9					21

	Scientific-research work of postgraduate	Scientific-research work of postgraduate	2	8					14
	Complex exam	Complex exam	1	3					6
	Registration and protection of postgraduate dissertation	Registration and defence of Master dissertation	3	10					18
Total in semester			**9**	**30**					
Total in theoretical study			**42**	**97**					
Total in module educational programme			**59**	**120**					

C Peer Report for the ASIIN Seal

1. The Degree Programmes: Concept, content & implementation

Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)

Evidence:

- Self Assessment Report
- Objectives-Modules-Matrix
- Homepage of the ENU: http://fen.enu.kz/index.php?option=com_content&view=category&id=8&Itemid=37&lang=en

Preliminary assessment and analysis of the peers:
The auditors hold the opinion that the objectives and intended learning outcomes of the Bachelor degree programme Biology are comprehensive and well founded: The students acquire a sound fundamental basis in biology-relevant knowledge of mathematics and natural sciences. They gain methodological competence in the biological sciences and are able to carry out practical and research work in laboratories. They are also able to solve subject-relevant problems and can present the results. In addition they have trained their analytical and logical abilities and have an awareness of possible social, ethical and environmental effects of their actions. During the course of their studies, the students have also acquired communicative skills, can work in a team and have developed a strategy for life-long learning.

The auditors are convinced that the intended qualification profile of the Bachelor degree programme Biotechnology is reasonable and useful: The students are capable to navigate in space of modern biotechnology, know the latest developments, research trends and their practical implementation in industrial, medical, agricultural and environmental biotechnology. In addition they can work in a team, have sufficient communicative skills and acquire fundamental knowledge and competences in molecular biotechnology, cell and tissue engineering and bioengineering.

The auditors hold the opinion that the objectives and intended learning outcomes of the Bachelor degree programme Ecology are comprehensive and well founded: The students acquire a sound fundamental basis of natural sciences, biogeochemistry, ecotoxicology and geoecology. They are also able to engage in environmental resource studies, have an understanding of the origin and evolution of the biosphere, the problems of environmental protection, the rational use of natural resources and of natural resource management and geo-ecology. During the course of their studies, the students have also acquired communicative skills, can work in a team and have developed a strategy for lifelong learning.

The objectives and intended learning outcomes of the three Master degree programmes are also comprehensive and well founded from the auditor's point of view: The students have advanced their knowledge in core and interdisciplinary subjects and are in a position to discuss complex subject-related problems and research results. They can carry out independent scientific work and present their own research results in writing and orally. In addition they have acquired social competences, the capability for teamwork and the ability to communicate internationally and interculturally.

The objectives and learning outcomes of the degree programmes are published on the homepage of the higher education institution and are therefore easily accessible to the public, i.e. to students, teaching staff and all other stakeholders. Finally the peer group judges the objectives and learning outcomes of the degree programmes to reflect the intended level of academic qualification and to correspond with the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 10 – Life Sciences.

The auditors are convinced that the graduates of the Bachelor degree programmes obtain all necessary fundamental knowledge and competences for a professional career in the areas of modern biology (molecular and cell biology, genetic engineering, genomics, molecular medicine) biotechnology (cell and tissue engineering, bioengineering, biosynthesis) or modern ecology (industrial ecology, social ecology, economics of natural resources).

The graduates of the Master degree programmes have acquired substantial research skills and competences in order to obtain leading positions in the areas of modern biology, biotechnology or modern ecology.

In summary the auditors are convinced, that intended qualifications profile of all degree programmes allow the students to take up an occupation which corresponds to their qualification.

The auditors confirm that while developing the objectives and learning outcomes the HEI has also taken into account the situation on the national job market, the research areas of the Department and the latest scientific achievements. As a result, the relevant stakeholders were included in the process of formulating and further developing the objectives and learning outcomes.

Criterion 1.2 Name of the degree programmed

Evidence:

- Self Assessment Report

Preliminary assessment and analysis of the peers:
The auditors hold the opinion, that English translation and the original Russian/Kazakh names of the Bachelor and Master degree programmers Biology, Biotechnology and Ecology correspond with the intended aims and learning outcomes as well as the main course language.

Criterion 1.3 Curriculum

Evidence:

- Self Assessment Report
- Objectives-Modules-Matrix
- Module descriptions
- Curricular overview

Preliminary assessment and analysis of the peers:

The curriculum for the Bachelor degree programme Biology contains General Compulsory Modules (e.g. history, foreign language, politics, physics, mathematics, economics, informatics), Compulsory Modules in a Specialty (e.g. botany, zoology, cell biology, molecular biology, microbiology, biochemistry), Elective modules (e.g. biomedicine, human genetics, gene and cell engineering), practical training and the Bachelor's thesis.

The curriculum for the Bachelor degree programme Biotechnology contains General Compulsory Modules (e.g. history, foreign language, politics, physics, mathematics, eco-

nomics, informatics), Compulsory Modules in a Specialty (e.g. anatomy and morphology of plants, biodiversity, plant physiology, fundamentals of biotechnology, biochemistry, processes and devices of biotechnology), Elective modules (e.g. human and animal physiology, basics of breeding, virology, enzyme engineering), practical training and the Bachelor's thesis.

The curriculum for the Bachelor degree programme Ecology contains General Compulsory Modules (e.g. history, foreign language, politics, physics, mathematics, economics, informatics), Compulsory Modules in a Specialty (e.g. biodiversity, bioecology, origin and evolution of the biosphere, environmental protection, ecological monitoring) Elective modules (e.g. social ecology, use of water resources, urbanization, tourism and recreation, soil science), practical training and the Bachelor's thesis.

Fundamentals of natural sciences like chemistry and physics as well as mathematics and informatics are taught in the second year of studies and provide the students with the necessary knowledge in those areas.

Practical training also enables the students to work in teams, while the Bachelor thesis establishes interdisciplinary relations by linking previously acquired professional competences of different modules. The students also learn to present and discuss scientific topics with experts and fellow students. In the Bachelor degree programmes the subject specific basics are taught that qualify the graduates for the national job market.

The curriculum for the Master degree programmes consists of compulsory and elective modules and includes theoretical training, studies of advanced subjects, professional practice and research work - including the Master's thesis. The emphasis is laid upon research activities and the specialization in certain areas of interest.

The curriculum for the Master degree programme Biology contains General Compulsory Modules (e.g. history, foreign language, pedagogy, psychology), Elective modules (e.g. gene expression, human physiology, genetic engineering), practical research work and the Master's thesis.

The curriculum for the Master degree programme Biotechnology contains General Compulsory Modules (e.g. history, foreign language, pedagogy, psychology) Elective modules (e.g. molecular diagnostics and gene therapy, modern methods in biotechnology, drugs biotechnology) practical research work and the Master's thesis.

The curriculum for the Master degree programme Ecology contains General Compulsory Modules (e.g. history, foreign language, pedagogy, psychology) Elective modules (e.g. ecological physiology, rational use of resources, geoecology, environmental policy and management) practical research work and the Master's thesis

There is an individual education plan for each student, is it signed at the beginning of each semester, it helps the university to plan the staff requirements and the organization of classes. As a result the students have to decide which electives to choose from at the beginning of each semester. It is possible for the students to change this plan within the first two weeks of the semester, and it is also possible to choose an individual emphasis on a special area of interest and to follow that through the studies.

The peer group notices that in the Bachelor and Master degree programmes Biology no modules are offered in structural biology and bioinformatics. The programme coordinator explains, that in the 4th year of the Bachelor degree programme Biology a compulsory module "Introduction informational biology" is offered. In order to offer a course in structural biology expensive equipment would be needed and thus far the university has not been able to finance this equipment. Also qualified teaching staff for a module "structural biology" would be needed. Members of the teaching staff confirm the view of the peer group that bioinformatics is becoming more and more important and a module in bioinformatics should be part of the Master degree programme Biology. The peer group therefore recommends to offer more courses in bioinformatics and to think about the introduction of structural biology into the curriculum of the Master degree programme Biology.

All the classes are taught in Russian and in Kazakh, basically in each degree programme there is one group of students that attends the classes in Russian and a different group of students that attends the classes in Kazakh. In addition there is one group of polylingual students in the Master degree programme Ecology that attends classes in Russian, Kazakh and English.

The auditors inquire about the employment perspectives of the graduates, they learn that some graduates of the Master degree programmes work as teachers in high school but most find adequate jobs in the private sector. ENU follows the career of its graduates and tries to keep in contact with them. The auditors conclude that the high acceptance of the graduates and their good opportunities on the labor market are a sign of the high quality of the degree programmes.

In summary the peer group draws the conclusion that the curriculum each of the degree programmes allows the students to achieve the intended learning outcomes.

Criterion 1.4 Admission requirements

Evidence:

- The Regulations of admission to the Bachelor`s programme of Republican state enterprise on the right of business L.N. Gumilyov Eurasian National University for 2013-2014
- The Regulations of admission to the Master`s programme of Republican state enterprise on the right of business L.N. Gumilyov Eurasian National University for 2013-2014
- Self assessment report
- Statistics of Applicants for Degree Programmes of Cluster B

Preliminary assessment and analysis of the peers:

Admission to the Bachelor degree programmes is based on the candidate's application in accordance with the sum of points of the certificate issued by the results of the unified national testing (UNT). All high school graduates in Kazakhstan have to pass this test in order to be able to apply for studying at a national university. In addition a high school graduate should have an interest in biology and select it as the fourth subject profiling at the United National Test (UNT).

Admission to the Master degree programmes is based on the state Regulations and ENU Rules of admission. According to these rules, students applying for a Master degree should pass a language exam (English, French, German) and a specialty subject exam. A graduate student should have all prerequisites (disciplines, containing the knowledge and skills necessary for the development of the studied discipline) required for the appropriate professional training in a Master degree programme.

Students applying for a Master degree programme must first pass a test of foreign language (usually English) and then a subject specific test (written exam). The sum is the admission points that form the basis of the decision about the admission.

At the same time, those applicants for the Master degree programmes, who want to be enrolled at related specialties, but have insufficient number of credits in the diploma supplement or do not have all required prerequisites have an opportunity to study the prerequisites on a fee basis prior to the admission.

In Kazakhstan, the demand for university graduates is determined by a state order. This plan includes how many state grants can be awarded each year for specific subjects at certain national universities. The high school graduates who achieve the highest scores on the UNT receive a state grant and can choose the subject and the university where they want to study. A state grant includes free tuition and a scholarship for living expenses.

The state government decides how many grants are given to certain subjects to the national universities. The results of the nationwide test are published in a certain magazine. If a student has good grades in his first semesters at the university, he can apply during the studies for a state grant.

In 2014 the percentage of students in the degree programmes who received a state grant was: Ba Biology 31%, Ba Biotechnology 42%, Ba Ecology 35%, Ma Biology 50%, Ba Biotechnology 42%, Ba Ecology 21%.

It is also possible to enroll on a fee-paid basis. Enrollment is carried out separately for each degree programme and study language.

In summary the auditors find the terms of admission to be binding and transparent. They confirm that the admission requirements support the students in achieving the intended learning outcomes and that there are clear rules how missing individual admission requirements can be compensated.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 1:

The Higher Education Institution informs the peers that additional courses in “Bioinformatics” are going to be introduced in the curriculum of the Bachelor Degree Programmes Biology and Biotechnology. In addition the HEI plans to introduce the course “Structural Biology” in the Master Degree Programme Biology and the Biology Department has filed a request to buy the necessary laboratory equipment. The peers are pleased to hear about these efforts and regard the criterion as mostly fulfilled.

2. The Degree Programmes: Structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Self Assessment Report
- Objectives-Modules-Matrix

- Module descriptions
- Regulation on the procedure of transfer credits by type of ECTS in ENU

Preliminary assessment and analysis of the peers:
The auditors confirm that all degree programmes consist of modules that have been adapted to the requirements of the degree programmes. Each module is a package of connected learning units grouped in compulsory and elective sections. The module descriptions contain all required information; they are annually reviewed and adjusted if necessary. From the auditors point of view the structure of the modules ensures that the qualification level and the intended learning outcomes can be achieved and that the students can complete the degree programmes successfully without any delay.

The auditors can verify that all intervals of practical work are well integrated into the curriculum and that ENU vouches for their quality in terms of relevance, content and structure. The students write a report about their practical work and this report is reviewed by a member of the teaching staff. This scientific advisor also visits the organization where the internship is done and checks the equipment and talks with the people responsible there. If the students complain about the quality of the internship the cooperation is being cancelled. The contacts made during the internships can be used to write the final thesis at the same company or research institution. The teaching staff has a list of projects for the final thesis and the students can choose what topic they want to write their thesis about.

ENU selects the companies and research institutions where the students can do their internships and the students give feedback about the quality of the work. If the feedback is negative and a student complains about the quality of the internship the cooperation is not continued. The auditors learn that there are around 900 agreements between companies and ENU. The companies define certain areas of competence that the students should have and are involved with the university in organizing internships and the final thesis.

The scientific advisor controls the quality of the internships which is usually very good. The students confirm that they are satisfied with the organization of the practical work. Part of the practical work is done in secondary schools, because some of the students want to become high school teachers.

The auditors notice with satisfaction, that even Bachelor students can take part at research projects, they just have to talk with their scientific supervisor and discuss the plans with him. The auditors learn that the bachelor students would like to do even more prac-

tical work in the laboratories. They support this demand and recommend increasing the amount of laboratory work in the Bachelor degree programmes.

The teaching staff confirms the impression of the peer group that the academic mobility especially of the Master students is very high. Actually the auditors notice that the academic mobility of the students is not as low as described in the self assessment report. There are a lot of international cooperations with foreign universities in Israel, Russia, France, Italy, Germany, Japan, USA, Poland, Slovenia, Portugal and Spain and almost every Master student spends some time abroad. ENU finances the studies and offers grants and is taking part at the Erasmus Mundus Programme. On the other hand students from China, Russia, and Afghanistan come to Kazakhstan.

The auditors notice, that there are no regulations concerning the recognition of academic qualifications gained from other institutions of higher education, in particular from foreign universities. Although only students from other Kazakh universities transfer to ENU that situation may change and since Kazakhstan is member of the European Higher Education Area (EHEA) there must be rules for recognizing achievements and competences acquired outside ENU. For this reason the auditors ask ENU to provide these regulations.

A lot of students would like to study at European and American universities and the auditors observe with approval that there is no problem with Kazakh students staying abroad and not coming back to Kazakhstan, so there is no “Brain-Drain”. Instead the students want to come back to Kazakhstan and improve the country. They are thankful for the opportunities offered to them and the good education that they receive and want to give back something to their home country.

ENU wants to increase the international mobility of its students, but the auditors must learn that financing the studies abroad is a big problem for the students. There is a program by the national ministry but that is not sufficient. Also double degree programmes are planned.

The peer group concludes that the modules have been adapted to the requirements of the degree programmes and they confirm that the module objectives help to reach the qualification level and the overall intended learning outcomes.

Criterion 2.2 Work load and credits

Evidence:

- Self Assessment Report
- Model Curriculum
- Module descriptions
- Regulation on the procedure of transfer credits by type of ECTS in ENU

Preliminary assessment and analysis of the peers:
The Bachelor degree programmes are designed for 240 ECTS, the Master degree programmes for 120 ECTS. According to the self assessment report, one ECTS credit is equal to 25-30 academic hours. The work load also includes independent educational work of student: essays, reports, term papers (projects), laboratory works, and preparation on the different types of exams, collection of materials and writing of final thesis. As a result all compulsory modules of the degree programmes are included in the work load. In each semester the students collect 30 credits. The duration of an academic year contains 30 weeks of lectures and 6 weeks of examinations

According to the curriculum, the master students take 5 modules each semester with 2 to 3 hours of classes per week and around 30h of self studies, the bachelor students take around 6 to 8 modules each semester with 2 hours of classes per week and around 20h of self studies. The auditors consider the workload to be adequate; it even allows the students to work part time in order to cover their living expenses.

In addition ENU offers a summer semester. The students, especially in the master program can take extra credits during the summer semester to make up for studying abroad or take classes to apply for an international stay. International professors are invited to give special classes during the summer semester. The summer semester is also designed for students that want to transfer to ENU and have to take some additional classes because of the difference in curriculum between universities.

In summary the auditors concluded that there is no structural pressure on the quality of teaching and the level of education due to the work load. The estimated time budget is realistic, and the students can complete the degree programme without exceeding the regular time frame

Criterion 2.3 Teaching methodology

Evidence:

- Self Assessment Report
- Module descriptions

Preliminary assessment and analysis of the peers:
According to the self assessment report several teaching methods and instruments are used:

- Explanatory and illustrative method. Students are taught in lectures from academic literature. They perceive and interpret the facts, evaluations and conclusions. The students remain within the reproductive thinking. This method is widely used for the transmission of large amounts of information.
- Method of problematic presentation. Using a variety of sources and resources, teacher present the material that raises the problem, formulates a cognitive task and compares the different approaches to a solution. The students become witnesses and participants of scientific research.
- Partial search or heuristic method. It is characterized by an active search for solutions to an academic problem guided by a teacher. This process requires innovative thinking and advanced cognitive abilities but is guided and supervised by the teacher.
- Research method. After analyzing the material and defining the problems and tasks, the students independently study the literature, sources, and then conduct observations, measurements, and perform other research actions. Initiative, independence and creativity are needed in this method.

In the Master degree programmes the amount of self study for each module is increased in comparison with the Bachelor degree programmes. There is self study under the guidance of a teacher and independent self study out-of-classes.

Altogether the peer group judges the teaching methods and instruments to be suitable to support the students in achieving the learning outcomes. Moreover they consider the degree programmes to be well balanced between attendance based learning and self-study.

Criterion 2.4 Support and assistance

Evidence:

- Self Assessment Report
- Regulation on advisors

Preliminary assessment and analysis of the peers:
ENU provides an extensive support system for all students with regard to studies and research. It includes consultations with advisors about the individual educational plan, the study progress and research activities. Furthermore, the adviser conducts educational work with the assigned students to improve their academic performance and attract them to participate in ENU social life.

In addition the students can contact their advisor any time for assistance in academic questions. The members of the teaching staff are available on any issues regarding the degree programmes and offer advice on research projects, particular modules, as well as on required papers.

The Department of International Cooperation support students and faculty members to spend some time at foreign universities. It also coordinates the admission of foreign students and organizes language courses (Russian/Kazakh/English) for both students and teachers.

The library offers free access to information in order to familiarize the students with values of national and global significance.

The health center helps with prevention of diseases, provides qualified medical care and examination to the students and university staff. There is a helping hotline where students can apply for any consultations.

The peer group notes approvingly the good and trustful relationship between the students and the teaching staff; there are enough resources available to provide individual assistance, advice and support for all students. The support system helps the students to achieve the intended learning outcomes and to complete their studies successfully and without delay.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 2:

The peers appreciate, that the HEI has increased the number of laboratory lessons in several modules of the Bachelor degree programmes in Biology, Biotechnology and Ecology.

The HEI points out, that courses completed in foreign universities can be recognized. The student has to submit a request for course recognition to the department. The details of the procedure are published on the HEI's homepage:

http://enu.kz/en/cooperation/inostrannymystudentam/obuchenie-po-obmenu/transfer-policy/

The HEI explains that 1 ECTS credit at ENU is equal to 27 hours for Bachelor degree programmes and 30 hours for Master degree programmes.

As a result the peer group concludes that no further recommendation regarding this criterion has to be issued. They consider the criterion to be fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Module descriptions
- Regulation on monitoring and evaluation of educational achievements of students
- Standard rules for current progress control, midterm and final attestation of students in higher educational institutions

Preliminary assessment and analysis of the peers:
According to the self assessment report there is a period for midterm exams and a period for the final exams. The form of the exams for each module is specified in the module descriptions. Periods of winter and summer examinations are scheduled in the academic calendar. During the examination period students take exams according to the approved schedule. The schedule provides 1-3 days off between the exams for preparation of the students for the next exam. The duration of each examination period is not less than two weeks. There is a comprehensive exam in each module, it is conducted by the teachers of all disciplines of the module and there is a joint examination score, which is set in the official transcript and on the online platform "Platonus". To make up for a failed examination a student must retake the module in the next academic term or in the summer semester. The summer semester is designed for students who have credit deficits and have failed some exams. The summer semester has duration of six weeks, during which a maximum of 18 credit points can be acquired. There is fee for each taken credit point.

There is also an ongoing monitoring of the students progress in his studies, it is evaluated by the teaching staff on the basis of attendance and preparedness for the classes.

Midterm examinations are obligatory and carried out in accordance with the academic calendar. Form and content of midterm examinations are determined by the teacher of each module. The 1st midterm exam takes place in the 7th week of the semester and the 2nd midterm exam in the 15th week of the semester. The sum of all points, for the midterm exams and the ongoing monitoring, are entered into the electronic journal by the teacher. If a student has not enough points, he is not allowed to take the final exam.

During the examination period the students must take all exams according to the schedule in strict accordance with the individual study plan. In some cases (due to illness, family emergency and other objective reasons) the Dean of the Faculty can make exceptions from this strict examination plan.

The final grade is composed of the admission points and the grade of the final exam. There is a central department that monitors the form of exams, 60% of the final grade derive from the ongoing monitoring and the midterm exams, 40% from the final examination. The students can see their results on online platform “Platonus”.

The grade for the final exam is given on a 100-point scale and this grade is entered in the student’s transcript. If a student gets "unsatisfactory" grade for the final exam, the final grade of the module is not counted. Retaking an exam to get a better result is not permitted. The final grade is ranked in accordance to the international ECTS grade system with letters in descending order, from “A” to “F”. Students, who are not satisfied with the result of their examination, have the right to appeal it. The Appeal Commission consists of members of teaching staff who have been appointed by the Rector.

Students that fail too many credits may lose their state grant and they have to repeat the academic term. Only very few students leave the university without a degree. During the first two semesters of the Bachelor degree programmes the students can take the final exam three times, afterwards only two times. The academic advisors and the teaching staff try to help the students to make up time lost by e.g. illness during the semester so that every student has a chance to pass the final exam.

The auditors point out, that the midterm exams and the ongoing monitoring should be mentioned in the module descriptions. They also learn that there are not more than 5 or 6 exams after each semester and that the students are very satisfied with the number and difficulty of the examinations.

The final exams are conducted in various forms. Oral exams are applied in a number of modules, tests are PC based; written exams are organized by the administration and are

controlled on an anonymous basis. A detailed examination plan is handed out to the students at the start of each semester. The auditors have to point out, that the specific form of the final exam is not mentioned in all module descriptions and that there are a lot of computer based test. Therefore they recommend reducing the number of computer based tests in favor of more oral and written exams.

The auditors inquire about the Bachelor and Master theses and would like to know, if the Bachelor and Master theses are done at the university or externally at companies or research organizations. In addition they ask about the involved quality management. They learn that the students can do their final thesis in research groups at the university or at external institutions. The professors offer certain subjects for the final thesis and the students can select from the offers and decide what topic they are interested in, all the students have a research advisor. The quality of external research activities is checked by the academic advisor, one supervisor of the final thesis must be a member of the teaching staff.

In the course of the on-site visit, the auditors have also checked sample Bachelor and Master theses of all degree programmes and the auditors point out that the final Bachelor theses and Master theses have a very high quality and are up to international standards.

The peers were informed by the students that drop-out rates are very low and that nearly all of the students finish their degree programme within the regular time frame.

The peers inspected a sample of examination papers and Bachelor's as well as Master's theses. They gained the impression that the overall quality of the samples reflects the level of the Bachelor's and Master's degree respectively.

The peers come to the conclusion that the ASIIN criteria regarding the examinations system, concept, and organization are all fulfilled.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 3:

The peers notice, that the HEI has already reduced the number of computer based exams and increased the number of oral exams. Therefore they abstain from issuing a recommendation regarding this criterion.

The HEI wants to point out, that also employers are involved in the management and the implementation of the degree programmes. They supervise the diploma projects and give an assessment about the final thesis. The peers recognize the high quality of the final Bachelor's and Master's theses and are satisfied with the involvement of the employers.

In summary they regard the criterion to be fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self assessment report
- Staff handbook
- Standard Qualification Characteristics of positions of scientific and pedagogical officials of higher and postgraduate education organizations

Preliminary assessment and analysis of the peers:
The auditors ask the Department heads about the composition and qualification of the teaching staff. They learn that each member of the teaching staff is approved by the Rector of ENU. The number of staff members is determined by the number of degree programmes, amount of teaching workload and the number of admitted students.

The teaching workload is reflected in the individual working plan and logbook, which is viewed, discussed and approved at a meeting of the department. The teaching staff consists of Professors, Assistant professors, PhDs and Teachers with a Master or Bachelor degree. In addition specialists from industrial fields and visiting professors from foreign universities are invited to deliver lectures and thus contribute to the internationality and professionalism of the department.

The auditors notice that the composition and qualification of the teaching staff is suitable to sustain the Master and Bachelor degree programmes (only professors and assistance professors can teach in the master degree programmes) and that the teachers have a higher qualification level in comparison with other universities in Kazakhstan. They also confirm that enough resources are available for administrative tasks and the supervision and guidance of the students.

The auditors are very impressed by the excellent and open atmosphere among the students and the staff members. They especially appreciate the collegial cooperation of the teachers and that there is obviously no professional jealousy involved. On the contrary, academic achievements are honored and acknowledged. The teaching staff is open minded and always focused on improving the quality of the degree programmes.

Finally the auditors find out that Professors and Assistant Professors are more involved in research activities than the other members of the teaching staff. Professors and Assistant Professors are also responsible for the organization of research, international cooperations and the supervision of students, while the other teachers are more involved with giving lectures and doing practical work in the laboratory. If teachers are scientifically successful (measured by the number of published articles) their teaching workload is reduced in favor of more time for research activities. There is a reward for teaching staff for publications in scientific journals or outstanding achievements in education. The auditors conclude that the research activities carried out by the teaching staff are in line with and support the level of academic qualification aimed at.

Criterion 4.2 Staff development

Evidence:

- Self assessment report
- Staff handbook
- Standard Qualification Characteristics of positions of scientific and pedagogical officials of higher and postgraduate education organizations

Preliminary assessment and analysis of the peers:
The auditors learn that ENU puts a strong emphasis on staff development and conducts a comprehensive evaluation of the pedagogical skills of the teaching staff once every three years. ENU regards the improvement of professional skills as an essential criterion of the teacher's career. Therefore there are a lot of opportunities for staff members to develop their pedagogical skills. ENU offers e.g. professional skills improvement courses, internships in foreign HEIs and courses of multilingual education. For instance a "Master class on teaching subjects in English" is held annually. Native speakers are at teachers' disposal for professional assistance in writing scientific papers in English.

To improve the quality of education there are regular scientific and methodical seminars with faculty members, students and postgraduates. Moreover members of the teaching staff are attending scientific and pedagogical internships and courses at foreign universities. Groups from the teaching staff are regularly send to European countries (e.g. Italy, Sweden, France, Sweden, Israel) to attend courses to improve their teaching skills, their knowledge of foreign languages and follow the development of the research in their area of specialization. Within the last three years around 500 people from the ENU teaching staff have taken part at this programme, it is mandatory for the teaching staff to take part once in five years.

In summary the auditors confirm that ENU offers sufficient support mechanisms and opportunities for members of the teaching staff who wish to further develop their professional and teaching skills.

Criterion 4.3 Funds and equipment

Evidence:

- Self assessment report.
- On-site-visit of the laboratories

Preliminary assessment and analysis of the peers:

During the audit the peer group also visited the laboratories in order to assess the quality of the infrastructure and the technical equipment. They could be convinced that there are no bottlenecks due to missing or out of date equipment or a lacking infrastructure. On the contrary, there is enough space in the laboratories and sufficient staff members for supervision and guidance, the technical equipment is up to date and available in sufficient numbers. A new building for the Bachelor students was opened last year so there are also enough seminar rooms and lecture halls.

In the ENU library the students have access to electronic scientific and educational resources and to the electronic library system, including current publications that are needed for study and research. The Faculty of Natural Sciences has four computer labs with more than 100 computers with Internet access that are open from 9.00 am to 20.00 pm.

The students expressed their general satisfaction with the available resources and conditions of studying, thereby confirming the positive impression of the peer group.

The auditors conclude that there are sufficient funds and equipment and that the infrastructure (laboratories, library, seminar rooms etc) complies with the requirements for sustaining the degree programmes.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 4:

The peer group considers the criterion to be fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Self assessment report
- Module descriptions.

Preliminary assessment and analysis of the peers:
The auditors confirm that the module descriptions are accessible to all students and teachers via the online platform “Platonus”. As mentioned before, the auditors complain that the midterm exams and the ongoing monitoring are not mentioned in the module descriptions, this should be changed. Moreover the description of the exams in the module handbook is not always clear and should be updated. Finally the auditors notice, that the names of the teachers are not specified in the module descriptions. This information must be added.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Self assessment report
- Sample Diploma Supplement
- Sample Transcript of Records

Preliminary assessment and analysis of the peers:
The peer group notices that a diploma is issued after graduation together with a Diploma Supplement. The Diploma Supplement is issued in three languages: Russian, Kazakh and English. It contains the structure, content and information about the obtained results and provides information about the individual performance as well as statistical data regarding the final mark. This allows the reader to categorize the individual result.

However the peer group complains that Diploma Supplement does not include a description of the student’s qualification profile. They ask the HEI to change that and to include this information in the Diploma Supplement.

Criterion 5.3 Relevant rules

Evidence:

- Self assessment report.
- Standard Qualification Characteristics of positions of scientific and pedagogical officials of higher and postgraduate education organizations
- Regulation on monitoring and evaluation of educational achievements of students
- Standard rules for current progress control, midterm and final attestation of students in higher educational institutions

Preliminary assessment and analysis of the peers:
The auditors confirm that the rights and duties of both the HEI and the students are clearly defined and binding. All relevant course-related information is available in Russian, Kazakh and English and accessible for all stakeholders.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 5:

The peers learn, that the HEI has already updated the module descriptions and included information about the form of the final exam, about the ongoing monitoring and the midterm exams. Moreover the names of the teachers have been added. The updated module descriptions can be found on the HEI's homepage:

http://fen.enu.kz/images/newstories/6m060700modcat.pdf

For this reason the peers do not issue a requirement regarding the module descriptions.

The HEI provides a new version for a diploma supplement for all degree programmes, but the peers still miss a detailed description of the student's qualification profile. They ask the HEI to include this vital information in the Diploma supplement.

In summary the peers regard the criterion to be partly fulfilled.

6. Quality management: Quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Self assessment report.
- Standard Qualification Characteristics of positions of scientific and pedagogical officials of higher and postgraduate education organizations
- Regulation on monitoring and evaluation of educational achievements of students
- Standard rules for current progress control, midterm and final attestation of students in higher educational institutions

Preliminary assessment and analysis of the peers:
The auditors ask the Department heads about the quality management system at ENU and learn that ENU has a quality policy since 2012. It implies a continuous process in order to improve the quality of the degree programmes and is carried out through internal and external evaluation. Internal evaluation of the quality of the degree programmes is provided through the review of all classes at faculty meetings and through student participation.

External quality assessment of the degree programmes is provided by institutional accreditation of the university and there is a special advisor in each department that monitors the labor market and talks with the companies about their needs and wishes according to the demands of the labor market

There is an online survey to ask the students about their opinion on the quality of the classes. This survey is provided on the online platform “Platonus” and offers the students the opportunity to give feedback on each module. Via the online platform the students can give feedback about their classes at the end of each semester. The auditors have the impression that the feedback is taken seriously by the staff and changes are made in the next year if there is a negative feedback. Approximately 60% of the students take part at the evaluation process.

A commission in the department analyzes the surveys and if the results are negative they speak with the responsible teacher and try to solve the problems. Members of the commission visit the classes and listen to the lecture, if the negative evaluation continues the teacher may have to leave the university, two teachers were dismissed within the last five years.

In summary the peer group confirms that the quality management system is suitable to identify weaknesses and to improve the degree programmes. The students and all other stakeholders are involved in the process and all necessary feedback cycles are closed.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 6:

The peers consider the criterion to be completely fulfilled.

D Additional Documents

Before preparing their final assessment, the panel asks that the following missing or unclear information be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

1. Detailed information about the process of recognition of qualifications gained from other institutions of higher education, in particular abroad.

E Comment of the Higher Education Institution (07.08.2015)

The institution provided a detailed statement as well as the following additional documents:

- Updated curricula for all degree programmes
- Updated Diploma Supplements for all degree programmes

F Summary: Peer recommendations (24.08.2015)

Taking into account the additional information and the comments given by ENU the peers summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	With require-ments	n.a.	30.9.2021
Ma Biology	With require-ments	n.a.	30.9.2021
Ba Biotechnology	With require-ments	n.a.	30.9.2021
Ma Biotechnology	With require-ments	n.a.	30.9.2021
Ba Ecology	With require-ments	n.a.	30.9.2021
Ma Ecology	With require-ments	n.a.	30.9.2021

Requirements

For all degree programmes

A 1. (ASIIN 5.2) The programme-specific diploma supplement must provide information about the objectives and the intended learning outcomes of the degree programme.

Recommendations

For the Master degree programme Biology

E 1. (ASIIN 1.3) It is recommended to introduce courses in “structural biology” into the curriculum and to offer more modules in “bioinformatics”.

G Comment of the Technical Committee 10- Life Sciences (03.09.2015)

Assessment and analysis for the award of the ASIIN seal:

The Technical committee follows the recommendations of the peer group.

The Technical Committee 10 – Life Sciences recommends the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	With requirements	n.a.	30.9.2021
Ma Biology	With requirements	n.a.	30.9.2021
Ba Biotechnology	With requirements	n.a.	30.9.2021
Ma Biotechnology	With requirements	n.a.	30.9.2021
Ba Ecology	With requirements	n.a.	30.9.2021
Ma Ecology	With requirements	n.a.	30.9.2021

H Decision of the Accreditation Commission (25.09.2015)

Assessment and analysis for the award of the subject-specific ASIIN seal:

The Accreditation Commission for Degree Programmes discusses about the procedure and approves the suggested requirements and recommendations by the peer group and the Technical Committee 10 (Life Sciences). In addition they issue a requirement with respect to the rules for the recognition of achievements and competences acquired outside of the higher education institution. The HEI must provide regulations that are based on the Lisbon Convention.

The Accreditation Commission for Degree Programmes decides to award the following seals:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	With requirements for one year	n.a.	30.9.2021
Ma Biology	With requirements for one year	n.a.	30.9.2021
Ba Biotechnology	With requirements for one year	n.a.	30.9.2021
Ma Biotechnology	With requirements for one year	n.a.	30.9.2021
Ba Ecology	With requirements for one year	n.a.	30.9.2021
Ma Ecology	With requirements for one year	n.a.	30.9.2021

Requirements

For all degree programmes

A 1. (ASIIN 5.2) The programme-specific diploma supplement must provide information about the objectives and the intended learning outcomes of the degree programme.

A 2. (ASIIN 2.3.) Rules for the recognition of achievements and competences acquired outside of the higher education institution must be based on the Lisbon Convention. Especially it has to be assured that in case of a rejected recognition the HEI is obliged to provide a transparent explanation.

Recommendations

For the Master degree programme Biology

E 1. (ASIIN 1.3) It is recommended to introduce courses in “structural biology” into the curriculum and to offer more modules in the field of “bioinformatics”.

I Fulfilment of Requirements (30.09.2016)

Analysis of the peers and the Technical Committee (02.09.2016)

The peers and the Technical Committee 10 – Life Sciences judge all requirements to be fulfilled and recommend the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	All requirements fulfilled	n.a.	30.9.2021
Ma Biology	All requirements fulfilled	n.a.	30.9.2021
Ba Biotechnology	All requirements fulfilled	n.a.	30.9.2021
Ma Biotechnology	All requirements fulfilled	n.a.	30.9.2021
Ba Ecology	All requirements fulfilled	n.a.	30.9.2021
Ma Ecology	All requirements fulfilled	n.a.	30.9.2021

Decision of the Accreditation Commission (30.09.2016)

The Accreditation Commission for Degree Programmes discusses about the provided Diploma Supplement and decides that there is no statistical data about the final degree included in the Diploma Supplement so that it is not possible to rank the individual performance of the student. Therefore, they judge requirement A 1 to be not fulfilled and ask the HEI to submit an appendix to the Diploma Supplement that includes statistical data about the final degree.

The Accreditation Commission for Degree Programmes decides the prolongation of the accreditation as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Duration of accreditation
Ba Biology	requirement A 1 not fulfilled	n.a.	6 months extension
Ma Biology	requirement A 1 not fulfilled	n.a.	6 months extension
Ba Biotechnology	requirement A 1 not fulfilled	n.a.	6 months extension
Ma Biotechnology	requirement A 1 not fulfilled	n.a.	6 months extension
Ba Ecology	requirement A 1 not fulfilled	n.a.	6 months extension
Ma Ecology	requirement A 1 not fulfilled	n.a.	6 months extension

J Fulfilment of Requirements (31.03.2017)

Analysis of the peers and the Technical Committee (16.03.2017)

The peers and the Technical Committee 10 – Life Sciences judge all requirements to be fulfilled and recommend the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	All requirements fulfilled	n.a.	30.9.2021
Ma Biology	All requirements fulfilled	n.a.	30.9.2021
Ba Biotechnology	All requirements fulfilled	n.a.	30.9.2021
Ma Biotechnology	All requirements fulfilled	n.a.	30.9.2021
Ba Ecology	All requirements fulfilled	n.a.	30.9.2021
Ma Ecology	All requirements fulfilled	n.a.	30.9.2021

Decision of the Accreditation Commission (31.03.2017)

The Accreditation Commission for Degree Programmes follows the assessment of peers and technical commitee and judges the remaining requirement to be fullfiled

The Accreditation Commission for Degree Programmes decides the prolongation of the accreditation as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	All requirements fulfilled	n.a.	30.9.2021

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ma Biology	All requirements fulfilled	n.a.	30.9.2021
Ba Biotechnology	All requirements fulfilled	n.a.	30.9.2021
Ma Biotechnology	All requirements fulfilled	n.a.	30.9.2021
Ba Ecology	All requirements fulfilled	n.a.	30.9.2021
Ma Ecology	All requirements fulfilled	n.a.	30.9.2021